VOL. LXXXIV PART TEN

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

OCTOBER 1959

PAGE

The Secretary's Page 437

Notes from Wisley. By N. K. GOULD 440

Masters Memorial Lecture, 1959: Plants and the Weather. Part I. By J. P. HUDSON, M.B.E., G.M., M.Sc., PH.D., N.D.H. *Illustrated* 443

Daffodil Trials at Wisley, 1959. By HERBERT R. BARR . 456

Irish Gardens and Gardeners. Part IV. By R. C. JENKINSON. *Illustrated* 460

Rhododendrons for Full Sun. By FREDERICK STREET. *Illustrated* 468

NOTES FROM FELLOWS:

Cherries in Tokyo. By COLLINGWOOD INGRAM . . 474

Gardenia thunbergia at La Mortola. By Mrs. D. HANBURY-FORBES. *Illustrated* 474

Clean Ground and *Lilium auratum*. By E. H. M. COX. *Illustrated* 475

WISLEY TRIALS, 1959:

Dimorphothecas 476

Plants to which Awards have been made in 1959 . . . 477

Book Note 480

VINCENT SQUARE, LONDON, S.W.1

Telephone: VICTORIA 4333

Don't run the risk of wood deterioration and let yourself in for the crippling cost of replacement. Use Cuprinol Wood Preservers on all woodwork to give it long lasting protection against Dry Rot and Wood-boring Insects.

★ **CUPRINOL GREEN DIP** Specially for dipping seed and bulb boxes, stakes, canes, wooden labels, etc. Supplied in 5 and 40 gallon drums.

★ **CUPRINOL GREEN • CLEAR • DARK BROWN** Use these to stop Dry Rot outbreaks and to protect against decay and woodworm. Can be varnished or polished, and Green and Clear can be painted over. *Green Cuprinol must be used for timber in contact with growing plants.*

★ **CUPRINOL HEAVY-DUTY BROWN** For protection of exterior timber only. Ideal for fences, sheds, posts, etc., which do not come in contact with plant life.

Information and advice on all preservation problems are available from The Cuprinol Preservation Centre. Please write or telephone :—

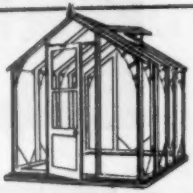
CUPRINOL LTD

DEPT. 68, TEMPLAR HOUSE, VICTORIA, LONDON, S.W.1. Tel: VICtoria 9274

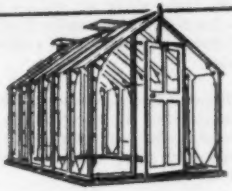
OAKWORTH

SEASONED OAK GREENHOUSES

"ZZ" Series.
All 5' 2" wide, from **£21.15.0.**



"T" Series.
All 6' 0" wide, from **£23.17.6.**



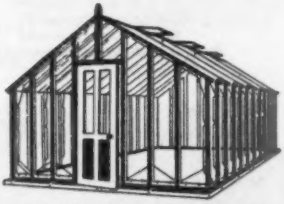
"K" Series.
All 7' 0" wide, from **£35.10.0.**

5 YEAR GUARANTEE

- ★ SCIENTIFICALLY CONSTRUCTED TO GROW MORE AND LAST LONGER
- ★ TREMENDOUS STRENGTH
- ★ MAXIMUM LIGHT
- ★ WILL NOT WARP OR ROT
- ★ ALL MODELS EXTENDIBLE

"D" Series.
All 8' 3" wide, from **£38.3.0.**

Complete prefabricated units. Delivered free to your door. Erected on delivery. Deferred Terms. Full details of prices and 50 sizes available in:



"DX" Series.
All 10' 5" wide, from **£53.15.0.**

FREE CATALOGUE

from

OAKWORTH GREENHOUSES
(Dept. J.R.H), WELLINGTON, SALOP.

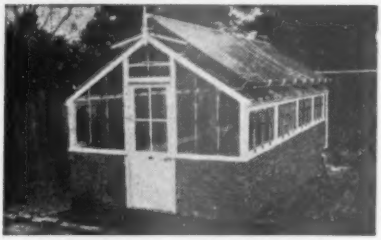
Lean-to's.
Various widths from **£21.15.6.**

THE NATION'S GREENHOUSE SPECIALISTS

GREENHOUSES WITH INDIVIDUALITY

Strawson Greenhouses are designed and built to meet your specific needs. Whether you are a specialist grower or an amateur and wherever in the country you are, Mr. Strawson himself will gladly come along on request to give you his expert advice and will supervise the design and building of your Greenhouse.

Strawson Greenhouses are praised and recommended by many leading horticulturists who rely upon Strawson's to house their prize plants — give yours the same protection.



There's nothing but quality in a STRAWSON Greenhouse.

- ★ **QUALITY** materials—including specially selected frame timbers, fully matured before use.
- ★ **QUALITY** workmanship — by Strawson-trained craftsmen.
- ★ **QUALITY** inspection — includes 100% pre-assembly and checkings by experts before despatch to site.

STRAWSON

Consult by letter or telephone at:

G. F. STRAWSON & SON (*Ref. B/19*)

HORLEY, SURREY · TEL. HORLEY 130

By appointment to H.M. Queen Elizabeth II Garden Contractors and Horticultural Builders William Wood & Son Ltd.

By appointment to H.M. Queen Elizabeth the Queen Mother Garden Contractors and Horticultural Builders William Wood & Son Ltd.

A habit of perfection . . .

Absolute perfection may elude us until the end of time, but William Wood have been engaged in testing and improving the craft of garden making for over a century. They provide a complete gardening service.

Planting, for example. William Wood undertake thorough preparation of the ground, incorporation of bulk humus, conscientious care and handling of plants, correct setting out and grouping, the use of peat and organic fertilisers at the roots, planting at the correct depth, firm staking, the application of a top mulch, free replacement of casualties, programmes for after care.

William Wood are also expert in the best techniques for the production of grass areas; mason's work, walls and paving; pools and fountains, making gravel paths and drives and the transplanting of large trees up to 30 ft. high.

William Wood & Son Limited

TAPLOW · BUCKINGHAMSHIRE

BY APPOINTMENT TO HER MAJESTY THE QUEEN
SEEDSMEN

BULBS
for
BOWL and GARDEN CULTURE

'BULBS AND LAWNS' CATALOGUE
(FREE ON REQUEST)

Bulbs for forcing and Garden Culture, Sweet Peas and Lawn Grass Seeds, for Autumn sowing, Hardy Plants, Fruit Trees. Garden Tools and Horticultural Sundries, etc.

Carters TESTED SEEDS Ltd.

134 Regent Street, W.1
129 High Holborn, W.C.1
53a Queen Victoria Street, E.C.4

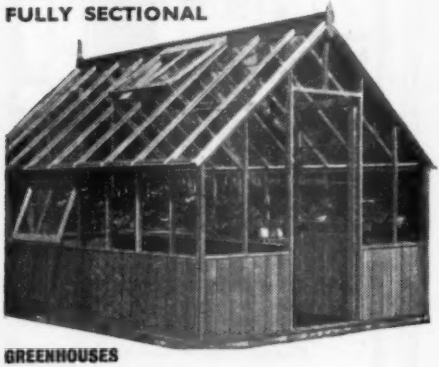
RAYNES PARK, LONDON, S.W.20

HALL'S *GUARANTEED* ANTI-ROT CEDARWOOD

SHEDS · GREENHOUSES · WORKSHOPS

Last Longer - Look Better!

NO PAINT NEEDED MORTICED AND TENONED JOINTS FULLY SECTIONAL



GREENHOUSES from £19.0.0

SHEDS from £13.15.0

NO DEPOSIT. First payment with order and balance over 6, 12, 18 or 24 months.

FREE *Write today for Super Catalogue showing Cedarwood in full natural colours.*

FREE DELIVERY ENGLAND & WALES

R. H. HALL & CO. (KENT) LTD · 44 PADDOCK WOOD · TONBRIDGE · KENT

READY NOW!

Send for your copy of

TOYNBEE'S NEW CATALOGUE contains 120 pages of first class Garden Plants, Trees, Shrubs, Roses, Hedge, Herbaceous, Rock and Climbing plants for Walls and Fences.

This latest issue is specially prepared for new gardens; it contains many choice additions for the connoisseur and one of the main features is the inclusion of several border plans designed for gardens of all sizes and for various aspects.

TOYNBEE'S 1959/60 CATALOGUE

(1/6 Post Free)

Your Guide to a beautiful Garden.

TOYNBEE'S NURSERIES, BARNHAM.

BOGNOR REGIS, SUSSEX *Tel. Eastergate 2121/2.*

ESTABLISHED 1730

Rivers *of Sawbridgeworth*

FRUIT TREES

ROSES · SHRUBS

HEDGING PLANTS

Grown for the private gardener on correct stocks and true to name

★

Catalogue on request, price 6d.

THOMAS RIVERS & SON LTD
SAWBRIDGEWORTH · HERTS
TELEPHONE 2338

CAMELLIAS

* * *

Large Vigorous Bushes

2 ft. — 5 ft.

* * *

PLEASE SEND FOR LIST

GAYGEAN NURSERIES,
REDWOOD,
PENSHURST, KENT

INTRODUCING

(and in time for your 'Late' Chrysanthemum Shows)

THE NEW AND SENSATIONAL

—BIKINI—

A "two-piece" Polythene Exhibition Vase for Show Blooms

Renew and Re-stock
With the following advantages over the conventional Metal Vase.

NO	YES
No leaking	Long life
No fading	Always looks new
No chipping	Keeps its lustre
No denting	Retains its shape
No tipping	Easy storage
No rusting	Quick packing

(Colour—mid-green)

YES! 12 WAYS BETTER—AND CHEAPER TOO

The Vase of the future, you can buy NOW

Send for a sample today. 7/6 each, plus 1/6 postage and packing.

(Quantity prices on application)

C. SALES & SON

(Horticultural Sundries)

17 HURST CLOSE, LONDON, E.4

Telephone: Silverthorn 1116-7

Trade Enquiries Welcomed

Orders despatched within 48 hours.

DOBBIE'S

of EDINBURGH

new Illustrated

BULB and ROSE CATALOGUE

POST FREE

on request

DOBBIE & CO. LTD

The Scottish Seed Establishment

EDINBURGH 7

TUBULAR HEATERS *by Humex*

Horticultural Sprayproof Pattern. Aluminium Case. Complete with fixing brackets. 60 watts per foot. Can be mounted singly or in banks on wall or floor.

(Single Units)	Carr. Paid		7 ft.	420 watts	...	81/9
2 ft. 120 watts	...	25/6	8 ft.	480 ,,	...	87/–
3 ft. 180 ,,	...	30/9	9 ft.	540 ,,	...	62/3
4 ft. 240 ,,	...	36/–	10 ft.	600 ,,	...	67/6
5 ft. 300 ,,	...	41/3	11 ft.	660 ,,	...	72/9
6 ft. 360 ,,	...	46/6	12 ft.	720 ,,	...	78/–

THE LOWEST PRICED – ANYWHERE!

To: **Roberts Elec. Co. Ltd.** (Dept. RHTU)
11–13 High Road, Byfleet, Surrey. *Tel.* 3897

WALTER C. SLOCOCK, Ltd.

FOR OVER 160 YEARS

RHODODENDRON SPECIALISTS

AND PRODUCERS OF FIRST-QUALITY

ORNAMENTAL TREES AND SHRUBS, FRUITS, ROSES, Etc.

Please write for copies of our

CATALOGUES

POST FREE

"RHODOS and AZALEAS" and/or "TREES and SHRUBS"

GOLDSWORTH NURSERY

WOKING ∴ SURREY

THE SHREWSBURY ROSES

We have some exciting

PERPETUAL MODERN SHRUB-ROSES

as well as a wonderful collection of old-fashioned and Species roses.

★

EDWIN MURRELL LTD

PORTLAND NURSERIES

SHREWSBURY

Sussex Grown

Nursery Stock

of finest quality

from our 100-acre Nurseries situated in the exposed fertile belt beneath the South Downs.

We Offer Large Quantities of

Roses, Fruits, Ornamental Trees and Shrubs, Conifers, Climbers, Hedge Plants, Herbaceous and Rock Plants in great variety

Visitors are cordially welcomed

Send for Illustrated Catalogue

BN Ltd

THE BARNHAM NURSERIES LTD.

BARNHAM, Nr. Bognor Regis
SUSSEX (Established 1880)

Laxton's

STRAWBERRIES

Leading growers since 1860, we are pleased to offer the following recommended varieties.

The finest pot-grown plants ready for planting NOW to produce fine crops next summer.

CAMBRIDGE VIGOUR (First early)
CAMBRIDGE FAVOURITE (Second early)
TALISMAN fine new sort (Late)

Per doz. 25/-: Per 50 85/-: Per 100 145/- Packing and carriage paid.

FREE!

Laxton's new Strawberry catalogue offering Royal Sovereign and all other worth-while sorts together with lots of useful information free and post free. Send for your copy now.

LAXTON BROS (Nurserymen) LTD
25 BRAMPTON · HUNTINGDON

For drift planting—

HARDY HEATHS

WINTER FLOWERING

CARNEA VIVELLII—a lovely dwarf, carmine flowers, bronzed foliage

HYBRIDA DARLEYENSIS—taller, light rose-purple flowers, deep green leafage, long blooming

Both these varieties have distinctive foliage and when planted in small or large groups are most effective and eye-catching.

STURDY YOUNG PLANTS—6 for 10/6
12 for 20/-; 50 for 70/-

MECONOPSIS BAILEYI—the superb Himalayan blue poppy
6 for 9/6; 12 for 18/-; 50 for 60/-

PRIMULA DENTICULATA—mixed hybrids, dainty flowers
Young plants—13/6 doz.; larger 18/- doz.

CARRIAGE PAID, C.W.O. OR C.O.D.

H. G. LYALL

165 BRICKET WOOD
WATFORD, HERTS.

WAKELEY'S

(Registered Trade Mark)

4-FOLD HOP MANURE

Stable manure is scarce, but you'll find Wakeley's Four-Fold Hop Manure a perfect substitute—Humus, Nitrogen, Phosphates and Potash—everything the soil needs from seed-time to harvest—to enrich it, and stimulate and sustain plant life and growth.

PRICES:

Small Bag 9/6, Medium Bag 14/6, Large Bag 24/-.

Prices subject to alteration without notice

FROM ALL THE BEST NURSERYMEN AND SEEDSMEN

or carriage paid England and Wales (Scotland 1/6 Large Bag; 1/- Medium Bag; 9d. Small Bag extra). If any difficulty, write to address below.

Write for new season's price list. Booklet of cultural instructions also sent if required.

Our list of Bulbs is now ready. Free on application.

WAKELEY BROS. & CO. Ltd.
235 Blackfriars Road, London, S.E.1

Now you can start earlier and enjoy sooner a wider range of plants and flowers

whether you have a cold or heated greenhouse. The Humex 'Propagator' consists of a low voltage warming wire embedded in sand on which you stand seed pans and pots surrounded with granulated peat. Large enough for average needs, it fits any greenhouse bench. Current consumption is low and controlled by a thermostat. You get almost 5 sq. ft. of propagating area for 3*d.* or 4*d.* a week – reducing, and often saving altogether, the cost of heating the whole greenhouse. *Send coupon below now for full details.*

Humex Electric 'PROPAGATOR'

for seed germination and striking of cuttings

POST TO-DAY *Please send me, without obligation, free leaflet on the Humex 'Propagator'*

NAME .....

ADDRESS .....

ROBERTS ELECTRICAL CO. LTD. (DEPT. RHP), Humex House, 11-13 High Road, Byfleet, Surrey. Phone: Byfleet 3897

SPECIFICATION Size: 36 ins. × 20 ins. × 11½ ins. A.C. Mains 200-250 v. Supplied complete with peat, glass for top, soil thermometer, 6 seed pans, thermostat and 2 yds. cable.

£13.10.0 CARR. PAID

THE UNIVERSAL AUTOGARDENER

ONE MACHINE PLOUGHS AND ROTARY CULTIVATES

Also cuts grass with Cutter Bar or 21" Rotary Cutter, trims hedges, saws timber, tows a trailer, sprays paint and insecticide, hoes.

FITTED WITH THREE FORWARD SPEEDS AND **REVERSE**

All **AUTO CULTO MODELS** are fitted with

4-STROKE ENGINES

Smaller **AUTO CULTO** Machines from £57

Write for details and name of nearest agent to:

ALLEN & SIMMONDS (AUTO CULTO) LTD

De Montfort Road, Reading, Berks. Tel. Reading 54471

NEW BIENNIAL AND PERENNIAL FLOWERS

THE POMPONETTE DAISIES. These miniature Double Daisies or Bellis carry a profusion of small, double flowers each one made up of a tight mass of firmly quilled petals. Neat and compact habit. Height 6 ins.

Pomponette Red. Bright crimson-scarlet.
No. 882. Per packet 1/-

Pomponette Rose Shades. Attractive shades of rose and pink. No. 883. Per packet 1/-

MYOSOTIS BLUE BOUQUET. The deepest and bluest of all Forget-me-Nots. Primarily a variety for cutting but useful also for bedding, especially with tall-growing bulbs. To provide cut flowers in winter and spring pot up in autumn and keep in a cold house.
No. 973. Height 15 ins. Per packet 1/-

MYOSOTIS MARINA. The best bright blue Forget-me-Not for spring bedding. The plants grow 6-8 ins. high and are extremely neat and uniform.
No. 1000. Per packet 1/-

DIANTHUS BLUE HAZE. A first-class bedding plant, rather like a blue Sweet William, with long-lasting and weather-resistant flowers. Blue Haze varies a little in height and colour but the general effect is of soft lavender-blue.
No. 944. Height 12-18 ins. Per packet 1/-

Please add 3d. extra for postage

FREE! *Ask for a copy of our 92-page colour-illustrated Garden Seed Book for details of many other new and interesting flower seeds.*

SAMUEL DOBIE & SON LIMITED
(DEPT. 66)
11 GROSVENOR STREET, CHESTER

The Directors of

W. C. WICKS LTD.

The African Violet Specialists

NOTTINGHAM Established 1880

tender sincere appreciation for the many letters of commendation for their Saintpaulia plants (and packing) season 1959. Sales have finished for this year, and will recommence end April 1960.

Attention is drawn to the excellent quality of other horticultural lines produced in quantity.

Hydrangea Hortensis in all the best modern sorts. These should be planted in every modern garden.

Rose Trees—Lambley grown, are unsurpassed for vigour and quality.

Decorative Shrubs and Trees etc.

Lists of above—stamped addressed envelope please.

House Plants. Our Mapperly nursery is stocked throughout with many thousands of these in over 50 well tried varieties.

Descriptive lists and culture hints—3d. and stamped addressed envelope.

"WE GROW ALL WE SELL"

BLOM'S BULBS

Evidence of
Traditional Quality

Please apply for Catalogue

WALTER BLOM & SON LTD.
(OF HOLLAND)

Leavesden · Watford
Hertfordshire

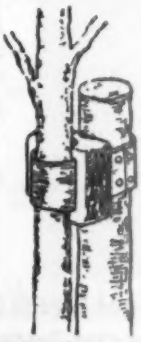
GROWERS OF FINE BULBS SINCE 1870

WHY DAMAGE TREES
WITH CORD TIES?

TOMS RUBBER TIES

AS USED BY GOVT. DEPTS., CORPORATIONS, PUBLIC BODIES, &c.

The Rubber slotted Pad is fixed to stake with tacks and receives the belt which forms the tie.



THE BEST TIE
For Young Trees
SIMPLE & EASILY FIXED WITH TACKS
FOR ROUND STAKES
17/- doz. 137/6 100
SMALL PATTERN
FOR STANDARD ROSES
1 doz. 10/6; 2 doz. 20/6;
3 doz. 30/-; per 100 80/-
Carriage Paid

J. TOMS
26 LONDON ROAD,
MAIDSTONE

GARDENS ARE PLANNED FOR THE FUTURE...

... FOR 60 YEARS THE "CGA" HAS PLANNED A COMPREHENSIVE TRADING AND PROFESSIONAL SERVICE FOR ITS MEMBERS

Particulars from THE COUNTRY GENTLEMEN'S ASSOC. LTD., 54-62 REGENT ST., W.1
(*Gerrard 0244*)

Are there any

POTHOLES OR WORN PLACES *in Your* **PATHS,** DRIVE OR FORECOURT?

Then REPAIR or RESURFACE with MENDAROAD, the simple self-applied Asphaltic material which can be Laid Cold with ordinary garden tools. Each bag is a complete unit providing a hard impervious surface ready for immediate use.

Not less than 3 cwts. 30/6 per cwt.
Not less than 6 cwts. 28/- per cwt.

RESURFACE WITH MENDAROAD
Single cwts. 32/6 per cwt.

Packed in ¼ cwt. bags Carriage paid England and Wales

MENDAROAD

DO IT YOURSELF - AT A QUARTER THE COST

GEO. A. WEBSTER & CO.
3 BUCKINGHAM PLACE, S.W.1
TATe Gallery 8933

A HOST OF USES FOR THE NEW 'HOSTESS' BASKET

Here's something new and fascinating in decoration — a small, all-metal basket with many a use in the home. Stove enamelled — in black — for extra long life, it provides a striking background for a variety of eye-catching table decorations. Just see how wonderfully useful this new 'Hostess' basket can be!

It costs only **2/11d.**
By post **3/6d.**
Six or more post free.

- For growing spring bulbs in
- For displaying cut flowers
- For arranging artificial flowers
- As an attractive fruit basket
- For cigarettes at party time
- To hand round sweets in
- For petit-fours and canapes
- For hospital gifts

Distributed by **PLANTOIDS LTD. Bromley, Kent**

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

VOL. LXXXIV PART TEN

October 1959

THE SECRETARY'S PAGE

ANNOUNCEMENTS—OCTOBER AND NOVEMBER

Delay in publication of the Journal—The Council regrets that the dispute in the printing industry has resulted in delay in the publication of the Journal. Every effort is being made to resume punctual publication as soon as possible.

Shows

THURSDAY, October 1 10 A.M. to 5 P.M.	**Great Autumn Show (Third Day),** in both Halls.
TUESDAY, October 6 12.30 P.M. to 6 P.M. WEDNESDAY, October 7 10 A.M. to 5 P.M.	Fruit and Vegetable Show, in the New Hall.
TUESDAY, October 13 12 NOON to 6 P.M. WEDNESDAY, October 14 10 A.M. to 5 P.M.	Fortnightly Flower Show, in the New Hall.
TUESDAY, October 27 12 NOON to 6 P.M. WEDNESDAY, October 28 10 A.M. to 5 P.M.	Fortnightly Flower Show, Tree and Shrub Competition and British National Carnation Society's Competition, in the New Hall.

Shows—*continued.*

FRIDAY, November 6 1 P.M. to 7.30 P.M. SATURDAY, November 7 10 A.M. to 6 P.M.	National Chrysanthemum Society's Show, in the New Hall.
TUESDAY, November 10 12 NOON to 6 P.M. WEDNESDAY, November 11 10 A.M. to 5 P.M.	Fortnightly Flower Show, in the Old Hall.

Lectures

TUESDAY, October 6, at 3 P.M. "The National Fruit Trials", by MR. J. M. S. POTTER, N.D.H.

TUESDAY, October 13, at 3 P.M. "Gardening on Heavy Clay Soils", by THE HON. SIR DAVID BOWES LYON, K.C.V.O., V.M.H.

TUESDAY, October 27, at 3 P.M. "Trees and Shrubs for Shelter Purposes", by MR. F. W. SHEPHERD, N.D.H.(HONS.).

Demonstration at Wisley—On Wednesday, November 18, there will be a demonstration on the Pruning of Fruit Trees, beginning at 11 A.M. The demonstration will be repeated at the same time on Thursday, November 19.

Restaurant at Wisley—The Restaurant at Wisley will be closed after October 4 until a date in 1960, which will be announced.

Lily Group Meeting—The Lily Group will hold a meeting in the Lecture Room in the New Hall on Tuesday, October 13, at 4.30 P.M., when there will be an exhibition of coloured lantern slides.

International Orchid Conference, 1960—The Third World Orchid Conference, which is being sponsored jointly by the American Orchid Society, the British Orchid Growers' Association and The Royal Horticultural Society, will be held in London in 1960. The first conference was held in St. Louis, Missouri, U.S.A., in 1954, and the second in Hawaii in 1957.

The exhibition of orchids arranged in connexion with the Conference will be staged at the Chelsea Show on Tuesday, Wednesday, Thursday and Friday, May 24–27, and the Conference will be held in the following week on Monday, Tuesday, Wednesday and Thursday, May 30 and 31, June 1 and 2. Excursions to leading orchid growers' establishments will be arranged on Friday and Saturday, May 27 and 28, and on Friday, Saturday and Sunday, June 3, 4 and 5.

A joint committee of the three sponsoring bodies is arranging a comprehensive programme covering a wide range of subjects of interest to amateur and professional orchid growers, and orchid specialists from

Australia, Belgium, Ceylon, Columbia, England, France, Germany, Japan, Malaya, South America, Sweden and the United States of America have already accepted invitations to deliver papers.

The Preliminary Programme is now available and anyone who wishes to have a copy should write to The Secretary, The Third World Orchid Conference, c/o The Royal Horticultural Society, Vincent Square, London, S.W.1.

Results of the Society's Examinations held in 1959

Examination for the National Diploma in Horticulture—This is the most important of the Examinations conducted by the Society, and is intended for the professional horticulturist. Candidates for the Examinations must produce evidence of having followed the vocation of horticulture for specified periods. Both the Intermediate and Final Examinations involve practical tests, conducted at Wisley and elsewhere, as well as written work.

In 1959 there were 133 candidates for the Intermediate Examination, of whom fifty-one qualified for admission to the Final Examination if or when they have had the required six years of practical experience. At the Final Examination there were 59 candidates, and the Diploma has been awarded as follows:

Section I—*General Horticulture*

MR. J. B. CLOUSTON
MR. R. CURRIE
MISS E. R. EASTOE
MR. C. ELLIS
MR. G. W. FLEMING
MISS N. M. HAINE
MR. C. T. HARDING
MR. J. L. JONES
MR. S. B. TREE
MR. J. TURNBULL
MR. A. VEEVERS
MR. I. G. WALLS

Section II—*General Commercial Horticulture*

MR. A. R. HOLE
MR. P. W. MALLETT
MR. D. M. PENNY
MR. A. A. TOMPSETT

Section III—*Fruit Crop Husbandry*

MR. D. V. METFORD
MR. J. M. W. MILLS

Section IV—*Vegetable Crop Husbandry*

MR. B. E. STEANE

Section VI—*Horticulture in Public Parks*

MR. R. A. BEE
MR. H. MCCREADIE
MR. J. J. SHANNON
MR. R. WOODHOUSE

National Diploma in Horticulture with Honours

MR. J. F. HAYDEN

Examination for the National Certificate in Elementary Horticulture—This Examination, which includes both written and practical tests, was held in 1959 at fourteen County Farm Institutes. In all there were 223 candidates in the various Sections of the Examination, of whom 39 obtained a "Pass with Credit" and 171 a "Pass".

NOTES FROM WISLEY

N. K. Gould

A YEAR or so ago we devoted one of these monthly articles to a description of the Temperate House at Wisley, describing in some detail the more important plants growing there. It is intended this month to give a similar account of the Half-hardy House. This house was originally occupied by peaches, but about twenty-five years ago the trees were removed and a series of tiered beds were constructed in their place. The object was to accommodate here a limited number of rather tender plants which could not be grown out-of-doors and which would for the most part be too small in growth to be associated conveniently with the larger trees and shrubs in the Temperate House. This object has to a large extent been achieved, but during the course of years the overcrowding which seems to occur even in the best regulated gardens has become noticeable here.

The range of plants which from time to time has found its way into this house is most extensive. Some, unfortunately, have been rather short-lived, but others have remained for many years and have been the source of very great pleasure to many visitors and have had the additional value of supplying material for lectures in the School of Horticulture.

We will deal first with some of the climbing plants trained to the roof supports. Just inside the door at the south end there is a specimen of *Metrosideros diffusa*, which in its native home in New Zealand climbs by aerial roots to the tops of tall trees. Here it has made a densely branched bush 7 or 8 feet tall covered with small evergreen leaves and in the spring bearing masses of crimson flowers with conspicuous yellow anthers. An interesting character of the plant is that in the juvenile condition its shoots grow along the surface of the soil and have very much smaller leaves than those of the mature plant, and we find that our specimen continues to send out these youthful growths from its base.

Next, there is *Mandevilla suaveolens*, a half-hardy deciduous plant which in some localities can be grown outside on a sunny wall. During the late summer and autumn it continues to open sweet-scented white flowers in bunches of six or more and these are frequently followed by the long pencil-thick paired fruits often joined at their tips.

Almost mixed with the last-named will be seen the sturdy annual stems of the graceful South African *Littonia modesta*, practically unnoticed until they produce in their upper parts apricot-coloured bell-shaped flowers. This is a member of the lily family related to the more familiar *Gloriosa* and another rather uncommon genus named *Sandersonia*. They all grow from rather thick and fleshy undergound tubers.

The South American genus of Composites named *Mutisia* has one or two species represented here and quite the best of these is *M. oligodon*,

which comes from Chile. Its straggly stem and the undersides of its somewhat holly-like leaves are covered with white wool and on the tip of each leaf there is a coiled tendril. For several months it carries a crop of flower-heads with spreading pale pink rays and, when these fade, a head of feathery fruits rather like a glorified "Dandelion Clock" takes their place. This and one or two other species, such as *M. decurrens* and *M. retusa*, can be grown in sheltered places outside.

An outstanding plant in the late autumn is a very unusual *Calceolaria* from Peru named *C. pavonii*, whose stout growths reach the top of the glass, carrying coarsely toothed leaves over 5 inches long and immense terminal panicles of rich yellow flowers in shape rather unlike those of the more common species. On the east side of the house there is an equally varied assortment of climbers and one of the first to flower in the spring is *Clianthus puniceus*, the "Parrot's-bill" of New Zealand. It has plentiful pinnate leaves forming a dense screen under the glass, and the long crimson flowers hang in bunches. There is a white variety, but this is perhaps less ornamental and it is very rarely seen. Next to this is trained *Doxantha unguis-cati*, the "Cat's-claw", so named because of the resemblance of the tips of its three-parted tendrils to the claws of a cat. It has attractive foliage and very large bright yellow blooms similar to those of *Campsis*, to which of course it is closely allied. One of the most desirable shrubs for a frost-proof house of this kind is *Jasminum angulare*, a South African species, which has neat dark leaves and for many months clusters of fragrant white flowers distinguished by their 2-inch-long tubes.

Many uncommon small shrubs are to be found in the Half-hardy House and one of the most remarkable is *Rosa persica*, which differs from all other roses in having a little greyish leaf composed of a single leaflet. Its flowers, too, are distinctive, being deep yellow with a red basal blotch.

One of the most lovely of foliage plants is *Chrysanthemum ptarmiciflorum*, a rare species from the Canary Islands. It has upright stems carrying elliptical leaves about 4 inches long, very finely dissected and calling to mind a delicate silver filigree. It rarely flowers but, when it does, it sends out a large and flattish panicle of neat white daisy heads.

Clematis nannophylla, from Kansu, must be one of the least common kinds in cultivation and this is easily recognizable by its erect growth, finely dissected leaves and mustard yellow autumnal flower.

Planted among the species already noted there are many different herbaceous plants, the majority of them bulbous or growing from some kind of underground tuber, and these provide a succession of interesting flowers all the year round. One which excites perhaps the greatest surprise is *Haemanthus coccineus*. For a short time around mid-summer all that is to be seen of this plant is the rather ungainly bulb protruding from the soil, but by early August there suddenly appear a number of stout, reddish scapes tipped by dense heads of scarlet flowers enclosed by broad red bracts. After these have died away the plant sends up

from each bulb a pair of enormous flat leaves a foot or more long. This, like many other plants here, comes from South Africa.

Another interesting species from the same region is *Moraea iridioides*, which makes an evergreen tuft of narrow leaves from which arise several wiry branched stems bearing gold and white Iris-like flowers. These come in batches and at the time of writing these notes one plant had two dozen flowers open on the same day. Some years ago a writer in an American scientific journal expressed the belief that in his South Californian garden the bursts of flowering in this species coincided with certain phases of the moon.

From Western China we have *Arisaema candidissimum*, related to the Arum lily, but very different in habit. In late spring it sends up one or two large and pale ternate leaves and among them appear the inflorescences, each consisting of a broad white, green-veined spathe sometimes flushed with rose and a single white spadix bearing minute flowers. Some of the plants are staminate, bearing only pollen, and in others they are all pistillate and these produce the seeds.

There are two very attractive species of *Narcissus*, one of which, *N. panizzianus*, from Northern Italy, may flower as early as October with heads of fragrant white blossom. The other, *N. dubius*, from Southern France, is one of the smallest of the Tazetta group, thought to be a natural hybrid. Its tiny flowers are perfectly formed and they come a dozen or so together early in the New Year.

Among the less conspicuous occupants of this house there are three plants which belong to a group sometimes known by the popular name "Lily Turf". The most striking of these is *Ophiopogon jaburan* var. *variegatus*. This makes a dense clump of hard evergreen strap-shaped leaves, sometimes 2 feet in length, striped with dark green and creamy white. During the summer it sends up a great number of sharply two-edged stems bearing at their tips dense inflorescences of small funnel-shaped white flowers. An unusual character of the plant is that the stalk of the inflorescence and also the individual flower-stalks are pure white. Closely related is *Liriope muscari*, which has a similar clump of plain green foliage and spikes of lavender-blue, rather more saucer-shaped, flowers, the spike in its young state rather recalling that of a Grape Hyacinth. This comes into flower in the late summer and is generally preceded by another species, *L. spicata*, which differs in having a longer and more open spike of paler flowers. The two genera have been much confused in the books but a close examination of the flower makes it easy to distinguish between them. The flower of *Ophiopogon* has the perianth joined in its lower part to the ovary and its stamens form a straight cone around the style, whereas in *Liriope* the ovary is free from the perianth and the stamens are curved towards the front of the flower.

There are many more plants which would repay a detailed examination, but description of these must be postponed to some future date.

MASTERS MEMORIAL LECTURE, 1959

PLANTS AND THE WEATHER

J. P. Hudson, M.B.E., G.M., M.Sc. Ph.D., N.D.H.

(*Lecture given on March* 24, 1959; H. V. TAYLOR, C.B.E., D.SC., V.M.H., *in the Chair*)

PART I

THE CHAIRMAN: As chairman at this lecture it is my very pleasant duty to say just a word or two about our lecturer, PROFESSOR HUDSON of Nottingham University. I have known PROFESSOR HUDSON now for many years. I first came in contact with him in Sussex, when he was the horticulturist giving advice to growers in Sussex. Then he joined the Army. After the war he went out to New Zealand as Horticulturist in the Department of Agriculture and had experience of horticulture out there. Then he came back as lecturer in horticulture at the University of Nottingham School of Agriculture, Sutton Bonington, where he later became Head of the Department of Horticulture, and then the first Professor of Horticulture in that Department.

PROFESSOR HUDSON has taken a great interest in horticulture, he has thought hard about its problems and now he is to talk to us this afternoon on a most interesting subject. It is one we all know a little about, but which we all take for granted—"Weather, and Plants". When you think about the wind and the rain, the sunshine and the frost that make up our weather, you all know that these have an effect on plants, but I wonder if there is any one of you who would be able to say precisely what effect the weather has on plants? It does have a tremendous effect, and PROFESSOR HUDSON has been worrying about these problems for some time. It is our good fortune to be able to listen to one who has thought about these things, and has studied these effects in detail.

I have not seen his lecture, but he may touch on the problem of how we can help our plants to withstand some of the disastrous weather effects. Just think in terms of wind: you have only to go to wind-swept places like the Scilly Isles and Cornwall to see what effect wind can have on plants. I daresay PROFESSOR HUDSON will mention shelter plants. It is a very difficult subject, for example, to decide what shelter plants to use for protecting a plum orchard. The only answer I myself can give is, I don't know. Anything you plant with advantage to your plum trees may at the same time have great disadvantages; it is a very complicated matter, and I do hope PROFESSOR HUDSON, if he finds time to get on to these problems, will tell us that a good deal of experimental work is now being done.

PROFESSOR HUDSON's lecture is in two parts; forming a series of what are called Masters Memorial Lectures.

DR. MASTERS was actually a dispensing chemist, living not so very far away from these buildings. He was interested in plants, as all chemists were in those days; he became a Fellow of the Society, and he sat on many of its Committees. In his will, MASTERS left a sum of money to provide for scientific lectures—and I specially emphasize the word scientific—to be given each year for the benefit of Fellows of The Royal Horticultural Society. So we are very much indebted to this chemist, who lived quite a long time ago, for his belief that science and its application could be beneficial to plants.

We have had these lectures each year: I have had the pleasure of being chairman at several of them, but I do not think there is any one that would give me as much pleasure to listen to as the one we are to hear this afternoon. We all know that weather affects plants very materially, but we have not had a scientist looking at it and presenting the facts to us as PROFESSOR HUDSON is likely to do. I am sure you will give him a most sincere welcome, and a very attentive hearing.

PROFESSOR J. P. HUDSON: The Masters Memorial lectures are intended to deal with some scientific matter and its application to practical horticulture. References to floods, drought, and prayers for rain in the earliest written records show that man has always been supremely conscious of the weather, from the time when he first started to practise agriculture and observed the catastrophic effects of some types of weather on his crops. Indeed, every aspect of plant behaviour is affected by the weather, but our knowledge of the precise relation between plants and the weather is still surprisingly slight, mainly because of the great technical difficulties involved in studying the exact effects of the weather on plants. However, the study of weather and plants is now making rapid progress and it is justified to regard "Plants and the Weather" as a subject which can be discussed in scientific terms and which certainly has a vital application to all aspects of horticulture.

The weather determines, first, whether or not a plant can survive at all in a particular place. If it can, the weather largely decides whether the plant will remain small or grow into a large one; whether it grows quickly or slowly; whether it will flower and set seeds, or otherwise reproduce itself; and, of course, whether it is worth growing as a garden plant for the pleasure or profit it can give.

Thus all horticulturists are necessarily interested in the weather, but the relation between plants and weather is a matter of much wider importance to the world as a whole in this generation, because of its effect on the vital question of matching food supplies to the needs of the people. The population of the world is increasing at an explosive rate, faster than ever before in history. At the most conservative recent estimate of the United Nations the number of people in the world will be almost double in the next thirty years, and certainly by the end of

the century (Table I). The central problem of our generation will be to increase food production much more rapidly than the population is

Table I. Recent United Nations estimates of world populations

Year	Estimated total
1900	1,550 million
1925	1,907 million
1950	2,497 million
1975	3,830 million
2000	6,280 million

growing, so that the increasing number of people in the world can not only be fed, but fed better than at present, when two-thirds of the world's population gets less than enough to eat to lead a full, productive and happy life. It is against this sobering background that I propose to discuss the effects of weather on plants.

SKILLS AND THE WEATHER

A useful concept in cropping is that the maximum possible yield of any plant is fixed by its heredity but that, up to that level, the crop actually produced depends upon two main factors, namely (*a*) the number of mistakes which are made in its cultivation and management, and (*b*) the suitability of the weather for the crop concerned.

Before considering the weather it is necessary to say something about horticultural skills or techniques, to help in distinguishing later between the effects of these operations and the effects of the weather. Yields are often reduced by mistakes in cultivation and management. Most cultural mistakes do not result in death of the plants concerned—indeed it might be better if they did, because we should then soon learn how to avoid making them! But every mistake, however trivial, probably causes a slight check to growth from which the plant never fully recovers. Thus maximum yields are only possible if cultural and managerial mistakes are avoided.

The highly skilled plantsman grows good crops by doing the right things to his plants, in the right way and at the right time. This applies to everything he does, from vital non-recurrent operations, such as propagating or harvesting, to the recurrent routine tasks of watering, cultivation and feeding. The craftsman's success usually depends on a combination of training, long experience and a well-developed but instinctive understanding of the needs of his plants. Unfortunately, the highest degree of skill appears to be rare, and men who are less skilled are prone to make errors of judgment that lead to cultural mistakes, since their work is not informed by the training and instinct of the best growers.

Science has shown that it can make a useful contribution to the

understanding of horticultural operations, which can be divided roughly into three groups, viz:

Ancient skills, still practised more or less in the traditional way, such as sowing seed and transplanting. Some, but not all, of the operations in this group have been partly mechanised, but mainly to the extent of doing the work by machine in much the same way as it was formerly done by hand.

Ancient skills which have been investigated scientifically and have emerged with a "new look", such as the pruning of fruit trees, and the preparation of seed and potting composts.

Entirely new skills and practices, based on recent scientific work, such as the use of growth substances, artificial irradiation and many methods of disease and pest control.

There is need for much more research on horticultural techniques, especially those in the first group, many of which indirectly affect the relations between plants and the weather—i.e. determine how plants will react to a particular set of weather conditions. However, the main theme of these lectures will be the second factor referred to earlier, namely the suitability of weather conditions for crop production.

WEATHER AND YIELDS

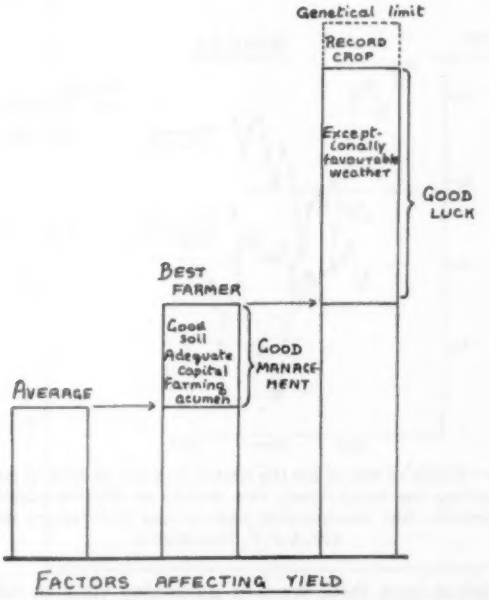
It is the common experience of all horticulturists that yields of any particular crop can vary enormously, and a great deal can be learned from a study of the many data on yields published by the Ministry of Agriculture, Fisheries and Food. First, yields vary from field to field on the same holding, or from one part of the garden to another, reflecting differences in soil and micro-climate. Next, they vary from one holding to another, even in the same district and on the same soil, reflecting differences in managerial talent between one grower and another. But, above all, yields vary from year to year, even on the same field or in the same garden and under the same management, depending on how nearly the weather happens to suit the precise needs of the crops that are being grown.

The yields for any crop show three levels, namely (*a*) the national average, (*b*) a much higher average on the best holdings, and (*c*) a yet higher figure for occasional bumper crops, which are usually produced by the best growers on the best land, and, of course, in an exceptionally favourable year when weather approached the optimal for the variety concerned (Table II). Thus there are two substantial bonuses above the average, one for good management and the other for good luck (since weather is still outside our control and largely a matter of luck) (Text Fig. 1). There is also a third, elusive bonus, depending on the limit of genetical capacity, but it is doubtful whether any crop has ever reached that limit, and we should not recognize its unique character even if it did.

There is far too great a difference between the yields obtained by

Table II. Figures showing typical differences in yields between the average for England and Wales (M.A.F.F. Statistics), the average on good holdings, and the record yields, for three typical crops.

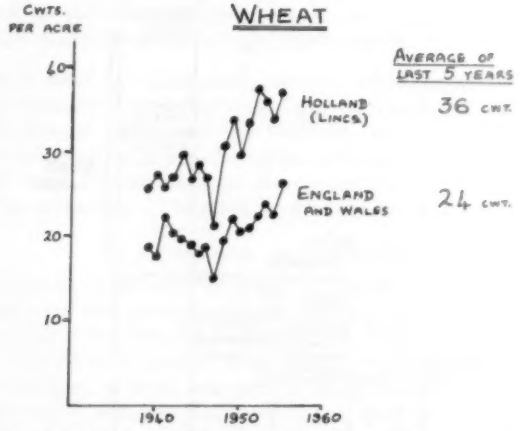
	Average (E. & W.)	"Best holding" Average	Record Crop
Wheat (cwts./acre) . . .	22	35	70
Potatoes (tons/acre) . . .	8	12	27
Tomatoes in glasshouses (tons/acre) .	40	90	110



TEXT FIG. 1—Diagram showing the relation between national average yield for a crop, the yield of good growers, the record crop and the ultimate limit set by heredity.

different growers even when they are working under similar natural conditions, and the relatively low yields which are often produced under favourable conditions seem to be due, as a rule, to the cumulative effects of relatively small managerial errors rather than to major mistakes, which growers soon learn to avoid. Clearly, good management will always be needed in crop husbandry and horticulture, and one of the aims of agronomy is to show how yields can be increased by better methods of managing such natural resources as soil and water, and indeed the plant itself. But the weather is still out of our control, and

seems likely to remain so for many years to come because of the enormous forces that would be required to change it on any major scale. Thus heavy yields still depend partly on good luck as well as on good management, especially in temperate regions where the weather is so variable and unpredictable. In Britain, where we are said to have "an equable climate but changeable weather" it must be rare for conditions even to approach the ideal for any particular crop throughout the whole of a growing season. It is therefore useful to consider the relation between plants and the weather, to see whether anything could be done to increase yields in spite of adverse weather conditions.

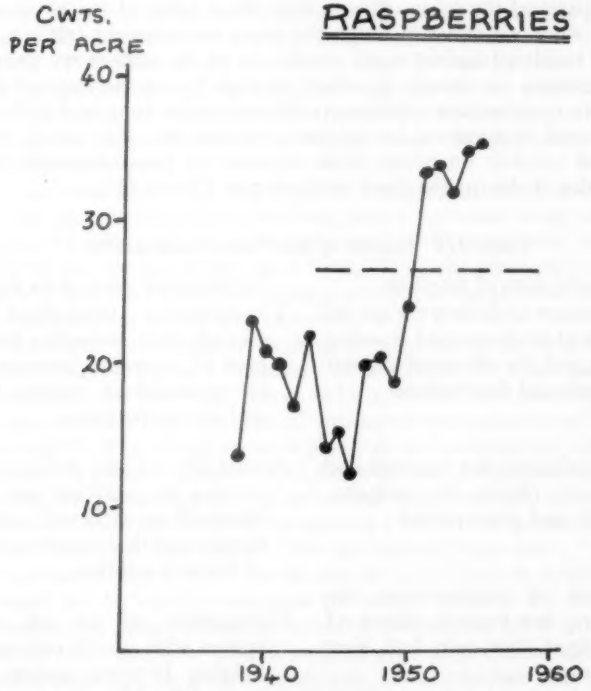


TEXT FIG. 2—Yields of wheat for the nation and for an area of particular good farming, showing the steady rise, due mainly to the introduction of much improved varieties, but considerable year-to-year fluctuations due to weather (M.A.F.F. Statistics.)

There are at least three ways of increasing yield in relation to the weather. The first approach, perhaps in the long run the most important, is to breed varieties that are more tolerant of adverse weather than the varieties now available, and that would thus yield heavier crops under natural conditions that are sub-optimal for the present varieties. The second is to modify the weather around the plants, either by subtleties of cultural practices or by the more expensive horticultural techniques of environmental control. The third, and most exciting approach, though still in its infancy and unproven as an aid to agriculture, is the possibility of altering the plant's responses to the weather by using chemicals to modulate behaviour.

Regarding the first of these approaches, growers and gardeners are always seeking better varieties, capable of giving heavier crops under their particular environmental and soil conditions, and the introduction

of improved varieties is one of the important reasons for the steady increase in average yields of most crops (Text Figs. 2 and 3), but we should not despise the varieties that are at present available. They are already very good, and occasional bumper crops show how far the usual yields fall below the optimal levels of which those varieties are capable. But these lectures will be confined mainly to the second and third



TEXT FIG. 3—Annual national yields of raspberries, showing the great fluctuations caused by weather from year to year and the spectacular rise in general productivity due to the introduction of better varieties and virus-free stocks in the early 1950's. (M.A.F.F. Statistics.)

possibilities, namely altering the "plant weather" and altering the plant's responses to weather.

PLANT MICRO-CLIMATE

It is necessary to consider what we mean by "weather", in this context, since there is not much hope of understanding the effects of weather on plants unless we can define and measure it. Meteorologists have been recording the weather for many years, and have accumulated a great

mass of data which is most useful in comparing the weather between one place and another since the readings are based on instruments given "standard exposure". That is rather unfortunate, from an agronomic point of view, since plants do not grow under "standard exposure", but it is encouraging to find that more attention is now being paid to the measurement of weather actually under and around crop plants themselves—the plant micro-climate. We are reasonably familiar with those aspects of the micro-climate that affect parts of the plant above ground, since we move in much the same environment (although we are well insulated against some conditions by the clothes we wear and the habitations we occupy, especially at night!), but the roots of plants occupy an environment which is wholly unfamiliar to us and difficult to comprehend in some of its curious complexities. Any study of the effects of weather on plants must embrace all the formidable list of factors that make up the plant environment (Table III).

Table III. Factors of the Plant Environment

Aerial parts of the plant	Subterranean parts of the plant
Temperature, including the special effects of levels around freezing point, and the effects of diurnal and seasonal fluctuations	Temperatures throughout the rooting zone, including the degree of harmony between soil temperatures at various levels and air temperature
Light, including the separate and different effects of intensity, quality and photoperiod	Availability of soil moisture, including the separate and combined effects of the soil moisture tension and the osmotic pressure of the soil solution
Incidence of precipitation, including the various effects of hoar frost, dew, rain, hail, sleet and snow	Composition of the soil atmosphere with special reference to balance between oxygen and carbon dioxide
Prevalence of mist and fog	Availability of plant nutrients
Vapour pressure (relative humidity)	Soil reaction (pH)
Composition of the atmosphere, especially the percentage of carbon dioxide and the degree of atmospheric pollution and smog	
Air speed (wind)	

The levels of most of the factors enumerated above are constantly changing, some slowly but others with great rapidity. The variations may be random or with some diurnal or seasonal basis. For instance, wind speed varies continually and unpredictably; on the other hand, light intensity varies randomly with the amount of cloud up to a maximum level, which itself varies regularly according to a diurnal rhythm depending on season and latitude. The length of the light period each day varies very regularly on a seasonal basis, with only narrow random variations on any particular day due to the incidence of clouds at dawn and dusk. The plant reacts in specific ways to various levels of each environmental factor, and in temperate regions we are accustomed to the marked changes which follow the march of the seasons, but the part played by particular factors in bringing these changes about is still imperfectly understood.

The current concept is that there is a range for each factor within which the plant is capable of surviving, and a narrower range where it can grow, but the plant can only grow and yield to capacity when all the factors are optimal at the same time. Thus the plant environment is plainly a system of great complexity, whilst the reactions of the plant to the environment are equally complex.

In assessing the effects of weather it must be borne in mind that there is no such thing as a "neutral" environment, to which plants do not react at all, and which can therefore be used as a convenient reference point; nor are there "normal plants" produced in response to a "neutral background". The condition of a plant, at any moment in time, is a summation of all its reactions to all the levels of all the environmental factors which it has experienced up to that time, and one of the difficulties is to decide what should be used as a yard-stick in assessing the effects of any particular factor. We can certainly not use a "perfect plant" as the criterion, since we do not yet know how to produce one and would not be able to recognize its unique status if we did! The combinations of greatest interest to the horticulturist are those which permit *survival* and *best growth* respectively, since these determine whether plants can be grown at all and, if so, whether they will be worth growing.

The range of variation, duration at different levels, and rate of change of each factor may all affect growth, and the plant will, in fact, grow and yield to capacity only when conditions are optimal for all factors simultaneously. The grower is thus concerned, not with one factor or another, but with all of them equally and at the same time.

ASSESSMENT OF ENVIRONMENTAL EFFECTS

A good deal can be learned from careful observation, and good plantsmen are always acute observers, but it is difficult to judge the effects of any particular environmental factor on a day-to-day basis unless it produces almost catastrophic effects on the plant, since the eye gives little indication of the short-term fluctuations in growth rate that are

caused when one or more of the factors falls below the optimum level. Indeed, the belief is commonly held, in agriculture and horticulture, that if a plant looks all right it is in fact growing satisfactorily. That is far from being the case. Growth rates may be depressed by unsatisfactory environmental conditions long before the plants concerned show any visible signs of distress. By the time growth can be seen to have slowed down, the plant will probably have had a check from which it can never fully recover. It follows that whatever remedial measures may then be taken to correct the factor or factors which are limiting growth, the plant can never grow as large nor yield as heavily, in a given time, as it might have done had it not received the check.

It is therefore clear that general appearance cannot be used as an accurate guide to the effects of weather on growth. Only careful experimental work can establish the optimal range of conditions for each factor in relation to all the others. This can best be done by studying the effects of different levels of each factor in turn, under conditions where all other factors are under control, using some satisfactory criterion for judging the effects of various treatments on the growth of the plant as a whole. Since the general appearance of the plant cannot be used as the sole guide for the reasons stated above, some more accurate method must be found of assessing effects of weather on plant behaviour. Although total yield is, of course, a very important aspect, it is not always satisfactory, since a particular type of weather may affect a plant so differently at different stages of growth as to cancel out benefits resulting at one season by checks caused at another. In fact, the technique of growth analysis (Gregory, 1953), has proved to be the most useful way of assessing the effects of weather, since growth analysis provides a running commentary by the plant on its response to environment. Such analyses throw much light on the relation between plants and the weather.

CONTROLLED ENVIRONMENTS FOR EXPERIMENTAL WORK

Nevertheless, despite the vast amount of meteorological data now available and the development of methods of growth analysis, we are still woefully ignorant about the precise effect of most factors of the environment on the behaviour of plants because of the difficulties involved in separating the effects of individual weather factors. Indeed, it is difficult to quote a single instance where the exact levels required for optimal growth throughout a season of even one factor are known with certainty for any important crop plant, and the acquisition of such knowledge has awaited a technique that could provide the agronomist with a manageable experimental system. This has now been provided by the powerful new research weapon of "environmental control" where plants can be grown in "man-made weather". The introduction of new types of electric lamps has made it possible to grow plants entirely under artificial light, enabling the behaviour of plants to be studied under specified environmental conditions, usually with close control of temperature and

light, and often with control of humidity and other atmospheric conditions.

Various types of equipment are used including *growth cabinets*, big enough to accommodate the plants but not the operator; *temperature-controlled rooms* without light, for providing specified conditions for plants at night or in the dormant season; *growth rooms*, with sufficient light to enable green plants to make healthy growth comparable with that made out-of-doors (Fig. 146); and *glasshouses*, that offer the advantage of using a proportion of the natural light but also many disadvantages in the control of other factors. The best-known installation for environmental control, offering a wide range of conditions in growth rooms and glasshouses, was opened in 1949 by DR. F. W. WENT at the Earhart Plant Research Laboratory, at Pasadena in California, which came to be known as the "phytotron" (Went, 1957). In the last few years other phytotrons have been built on the Continent, notably in Russia, France, Holland and Germany, and very large installations are now being planned in Australia, New Zealand and elsewhere. There is nothing comparable to these in Britain, but about seventy university departments and research stations have equipment for the control of plant environment. Although most of these installations are on a very modest scale they are producing some useful and stimulating results (Hudson, 1957*a*).

Controlled environments have proved to be useful in many fields of biological work, particularly in physiology, ecology and the study of morphogenesis, and many fascinating experiments in these fields have been described (Hudson, 1957*b*), but the main interest in these lectures is the agronomic study of the problems of plant behaviour in relation to the weather.

There are two quite distinct aspects of plant behaviour. The first is *qualitative*—whether the plant is making vegetative growth, or producing flowers, or becoming dormant, or producing organs with modified shapes or purposes. The second is *quantitative*—how quickly new leaves are being produced, how large they grow, how much the internodes elongate, how many flowers are produced, how big they grow, and so on. Weather may affect both the qualitative and quantitative responses of a plant and it is necessary to study these aspects separately if the full implications of weather are to be appreciated. Controlled environments can help in the study of both types of response.

EFFECTS OF SEASON ON QUALITATIVE CHANGES

Some of the qualitative changes in plant behaviour occur in response to changes in seasonal weather and it may only be possible to study these aspects at one time of the year if plants are grown out-of-doors, when workers must wait patiently for the appropriate weather to cause seasonal changes. By using suitable controlled environments it is possible to reproduce any particular seasonal condition and so carry out experiments at any time of year, irrespective of season or weather.

To the horticulturist, the most obvious effect of weather on development is the way in which many species flower in response to the length of day but that aspect was thoroughly covered by PROFESSOR F. G. GREGORY and PROFESSOR R. H. STOUGHTON in their Masters Memorial Lectures in 1953 and 1955 respectively, and need not be referred to in detail here. However, there are other equally interesting seasonal effects on the vegetative behaviour of plants, although these have not received such wide attention.

An example is shown by our own studies of the raspberry plant, which is, as every gardener knows, a perennial plant that bears its fruits on a succession of shoots that grow from about ground level one year and then fruit in the second year (Fig. 148). Each raspberry cane dies after fruiting, but is replaced by a new cane which has meanwhile grown from ground level, thus providing for next year's crop—an interesting case of a plant producing biennial shoots from a perennial root stock. In fact, the life cycle of a raspberry shoot is considerably more complicated than at first appears, and detailed observations in the field show that each shoot goes through no less than nine distinct phases of development during its two-year cycle.

First is the phase of *initiation*, when a bud is laid down on a root; then a phase of *elongation*, when the shoot grows to the surface, followed by a phase of *modified vegetative growth*, when a rosette of leaves is formed; this is followed by a phase of *dormancy*, when further development of the vegetative shoot virtually ceases, at ground level. In the following spring a period of *strong vegetative growth* ensues, during which the shoot elongates to several feet. This phase ceases in late summer or early autumn, when the tip rosettes again and *flowers are initiated* in the axillary buds, although most of these buds are still incapable of normal opening. *Dormancy is broken* by cold during the winter time, so that the next phase, *flowering*, can be induced by warmer weather in the early summer, after which the shoots *fruit* and then *die*.

It must be emphasized that each of these phases differ *in kind*, in that the behaviour of the growing plant is different in each phase from that in the preceding or following phases.

Since these phases are observed to occur with great regularity at particular seasons of the year in temperate climates, it was assumed that the progression from phase to phase was mainly the result of seasonal changes in the environment. This aspect has been investigated by my colleague, DR. I. H. WILLIAMS, who has elucidated the main effects of environment on development of the raspberry plant in a series of elegant experiments in four simple growth rooms where temperature, day-length and light intensity were controlled (Williams and Hudson, 1956). WILLIAMS has shown that differences in the behaviour of the apical meristem are largely brought about by changes in temperature and day-length, but there is an additional factor, in some phases, of "ripeness to proceed" to the next phase, since it seems necessary for shoots to remain for a minimum period in some phases before they can

enter upon the next, even though environmental conditions are conducive to that move. This is the first time that the connection between phasic development and weather has been worked out for a woody perennial and it points the need for much more work of the same type on other species.

WILLIAMS has shown that the raspberry shoot can be maintained in some of the phases for far longer than the normal period, but that successive phases can also be telescoped by moving plants from one environment to another as soon as they are ripe for the next phase (Fig. 148*b*). Indeed, he has been able to reduce the time spent in each phase to such an extent that ripe fruits have been produced in several experiments in little more than six months after the shoots had been initiated as buds on raspberry roots, thus reducing to a quarter the time which the complete cycle normally takes in nature.

EFFECTS OF WEATHER ON GROWTH RATES

Turning from the effects of weather on development (the *kind* of growth) to its effects on *rates* of growth, this aspect has been curiously neglected until very recently, apart from the pioneer studies of Gregory and a few other earlier workers. The ultimate aim of most research in agronomy must be to show how plants can be induced to grow more rapidly, since *yield* is largely dependent on growth.

The use of controlled environments seems to offer the only reasonable way, at present, of studying the complexities of the effects of the weather on growth, but the information thus obtained should one day enable techniques to be worked out for studying or explaining the full effects of the weather in the field. The final understanding of the responses of plants to the weather can only come from a study of the effects of environment at the biochemical level, a field still virtually unexplored.

The possibilities of altering the plant micro-climate, and of altering the plant's responses to weather, will be considered in the second lecture.

REFERENCES

GREGORY, F. G. (1953). 'The control of growth and reproduction by external factors', *Rep. XIIIth Int. Hort. Congress*, 1952, 96–105.

HUDSON, J. P. (1957*a*). 'Control of Plant Environment for Experimental Work', *Univ. Nottingham Dep. Hort. Misc. Pub.* 8.

HUDSON, J. P. (1957*b*). (Ed.) *Control of the Plant Environment*. London: Butterworths Scientific Publications.

WENT, F. W. (1957). *Experimental Control of Plant Growth*. Boston: Chronica Botanica.

WILLIAMS, I. H., and HUDSON, J. P. (1956). 'Effect of environment upon the growth and development of raspberry canes', *Nature*, **177**, 798–9 (and four papers in press in *J. Hort. Sci.*).

THE CHAIRMAN: PROFESSOR HUDSON has said sufficient to show some of the responses that plants make to weather. He made particular reference,

with pictures, to the response of the raspberry plants. He showed how the raspberry grows. It has to have a summer climate, and an autumn climate, before flower buds are formed in the axil of the leaf, and even then those flower buds could not grow out unless they experienced sufficient cold in the winter climate which followed. The winter induced some responses in the plant, probably chemical ones, that made it possible for the flower buds to grow out and produce fruit when the summer came. That is astonishing: I would not be surprised to find, when the scientists have time to go further into this question, that this weather effect is produced by special chemicals accumulating inside the plant in very limited quantities to give the stimulation needed to produce the various stages to which PROFESSOR HUDSON referred.

PROFESSOR HUDSON: I should like to make a comment on your remark about this question of the chemical response. I think you are absolutely right. The nature of these responses must in the last resort be determined by chemicals within the buds, but that is a field of knowledge where virtually nothing is known as yet.

THE CHAIRMAN: I am sure you would like to join with me in thanking PROFESSOR HUDSON for coming down from Nottingham to talk to us so refreshingly this afternoon on this very complicated subject.

DAFFODIL TRIALS AT WISLEY, 1959

Herbert R. Barr

IN many ways the daffodil season rather reminds me of a game of chess, no two games are the same, as no two seasons are alike. In 1959, it seemed in early February as if it would be a late flowering season following a very wet autumn and winter, also a spell of frost for several weeks in January; by early March growth was making some headway and with the help of a little warm and sunny weather before and during the Easter period, daffodils made such rapid progress that by late March the season could be called an early one.

The first meeting of the Sub-Committee who judged the Daffodil Trials at Wisley was held on April 3, in glorious warm sunny spring weather. The flowering cherries and forsythias were in full spate and the Alpine meadow was carpeted by *Narcissus bulbocodium* and *cyclamineus*. Those who wandered to the top of Battleston Hill were greeted by a superb sight of the double avenue of *Prunus yedoensis* in full flower like a *corps de ballet* with their snowy white arms flung high. Edging the shrubs on Battleston Hill were some fine clumps of daffodils from former trials. The *cyclamineus* hybrid 'Bartley' was in grand form, a lovely variety that received an F.C.C. in 1949. To me it is indistinguishable from 'Peeping Tom' but SIR FREDERICK STERN tells me that in his garden they are distinct. Equally beautiful was MR. COLEMAN's hybrid

'Jenny', which received the same award in 1950 and seems to be a grand doer at Wisley. There are many other of the older varieties to be seen around this area and I noticed that 'Tunis' was also in splendid form.

About half the trial was in flower at the time of our first visit and presented a delightful picture. Over the period of many years, I have never seen the trials in better form than they were this year; I feel that the Trials Officer and the staff at Wisley are to be congratulated. The trial beds were immaculately clean and there was no trace of virus nor Narcissus fly infection when we saw them. I understand that the bulbs are carefully inspected and rogued early in the year and any infected plants are then removed; I believe that very few were removed this year.

The flowering record was probably one of the highest ever recorded; as an example, 'Boswin' yielded 162 flowers from twenty-four bulbs and twelve other varieties produced over 100 flowers from a clump, with several more which came very close to this figure—these were produced from bulbs now in their third year. I can only imagine that the daffodils appreciated the phenomenally wet summer and autumn of 1958. I have found much the same in my own garden in East Sussex, where daffodils had been left down for two or more years; the quality, texture, colour and freedom of flower production seemed to be quite remarkable this season.

The Daffodil Trials are added to each year by the Narcissus Committee, who select varieties to be planted at Wisley that appear worthy for consideration as to their garden merits. So many varieties that are raised may be excellent for show purposes, when grown under sheltered conditions and provide immense aesthetic pleasure when seen on the show bench; but when some of these have to stand on their own in the garden, buffeted by the elements, they can disappoint as garden varieties. A garden variety must have good constitution, distinct colour, resistance to sun and wind and above all a good stem and poise, rather in the manner of the serviceability of country tweeds as opposed to the sartorial elegance of the drawing-room.

Visitors to Wisley have the advantage of being able to inspect in the trials some of the older varieties that have received awards in recent past years. Some of these are retained for comparison with new entrants and if they have not received the top award, they can be upgraded by the committee if they merit additional recognition. As the years pass, these older ones are eliminated from the trial beds, but are planted as clumps in the Gardens and many of them can be seen in 'Seven Acres' and on Battleston Hill, where they are all clearly labelled; a valuable historical living record is thereby provided, which becomes increasingly interesting as the years go by.

Our second visit to Wisley was made on April 10, immediately before the London Daffodil Show. The weather was not quite so kind and there had been some rain and buffeting winds between the two visits. With the exception of two or three late varieties, all were then

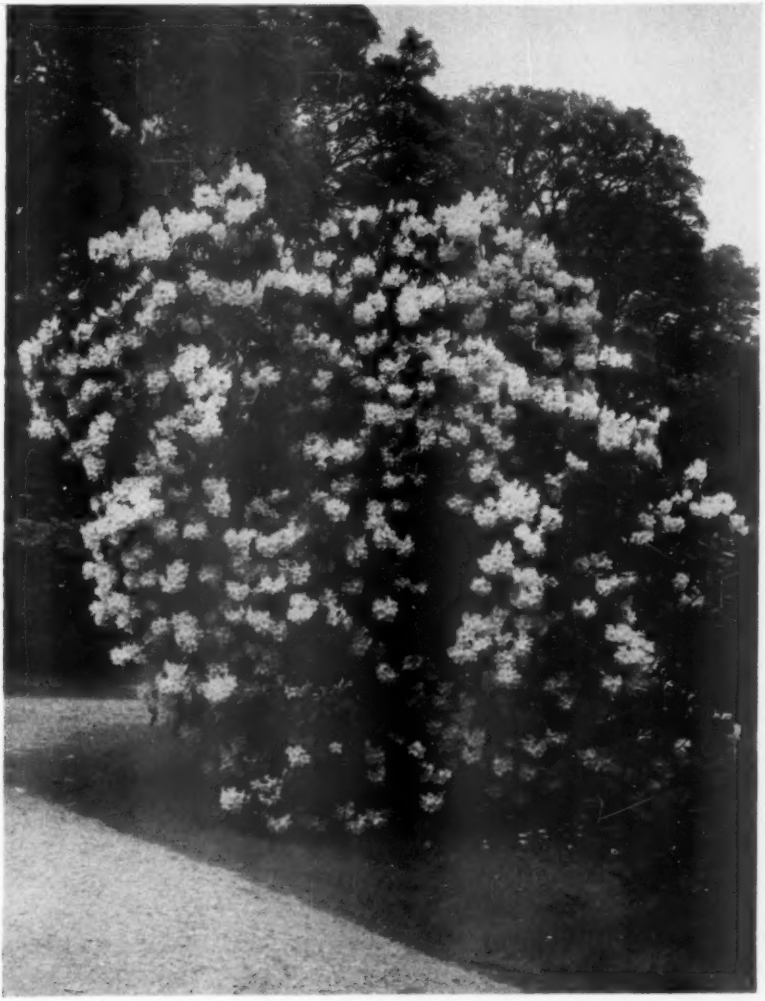
in flower and most of those which we had seen during the previous week were still in fine form.

There were some good yellow trumpet varieties in this series of trials. I would particularly praise 'Clonmore', which received an Award of Merit in 1958 and was deservedly raised to a First Class Certificate this year, when it produced 111 flowers from twenty-four bulbs; this variety was outstanding as a garden plant and the flowers produced were really up to show standard. 'Ulster Prince', which was in its second year and received an Award of Merit, equally impressed me and I would wager that the award will be raised next year; it produced fifty-eight flowers from eighteen bulbs in its second year. Both of these varieties were bred by my old friend MR. GUY WILSON, from whom we always expect, and indeed receive, perfection. Another excellent yellow trumpet which also received an Award of Merit was 'Joseph MacLeod'; a fine bold variety raised in Holland, and I understand from MR. SECRETT that it is a good early commercial variety, though it rather lacks the refinement of the two previous varieties I have mentioned. 'Rembrandt', another good commercial yellow trumpet, was similarly rewarded.

Perhaps I should interrupt myself here with a few words of explanation to readers who are not fully conversant with the requirements of the trials. When a variety is selected by the Narcissus Committee for trial at Wisley, twenty-five single-nosed bulbs are called for. They receive the usual warm water treatment at Wisley before being planted. They then remain down for a period of three years and are judged during their second and third years. Careful records of the number of flowers produced from each variety are kept each year by the Trials Officer at Wisley. During the three-year period they are annually examined by plant pathologists and any bulbs are removed and destroyed that may have developed virus infection or that have been attacked by the Narcissus fly; this accounts for the discrepancy in the number of bulbs where I have quoted the flower record.

Amongst the white trumpet varieties, 'Cantatrice' was again quite outstanding; it received a well-deserved First Class Certificate in 1958 and this year produced 105 flowers from twenty-four bulbs. In my judgment this is probably the best all-round flower raised by MR. GUY WILSON, not only is it a fine garden plant but it is so consistently good that almost every flower produced is of show quality, which is a merit that can be said of few. 'Mount Hood' showed up well—a good stolid white trumpet variety with a fine flower record of 110 blooms from twenty-three bulbs. 'Scapa' was also in excellent form and is another variety that produces flowers of show quality.

In the Large-cupped section Awards of Merit were given this year to 'Cavaliero' and 'Kilmorack', two good upstanding varieties with yellow perianth and red crown; 'Yankee Clipper', of a similar type, was also very good. Amongst older varieties in this section 'Rustom Pasha' was again quite outstanding with its sunproof flowers, even when the



Photo, J. E. Downward

RHODODENDRONS FOR FULL SUN

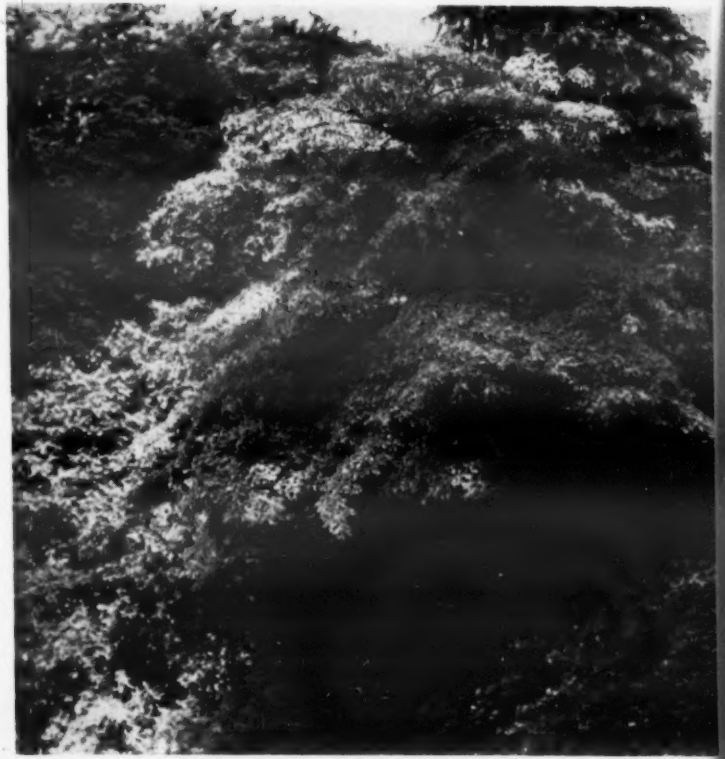
FIG. 138—Rhododendron 'George Hardy' (see page 471)

Photo, Marion Smith

FIG. 139—Rhododendron 'Mrs. Tom H. Lowinsky'. One of the best early hybrids with *R. griffithianum*

Photo, Frederick Street

FIG. 140—*Rhododendron vaseyi* in full sun



Photos, Frank O'Brian

FIG. 141—*Cornus kousa chinensis* at Annesgrove. A fine 20-foot specimen flowering in May (see p. 461)

FIG. 142—*Cornus controversa variegata*, also at Annesgrove; a very fine specimen 33 feet high (see page 460)

Photo, J. E. Downward

FIG. 143—Rose 'Fritz Nobis' **A.M.** June 9, 1959. An excellent free-flowering shrub rose of arching habit shown by The Sunningdale Nurseries, Windlesham (see page 478)

Photo, J. E. Downward

FIG. 144—*Camellia japonica* 'R. L. Wheeler' **A.M.** March 24, 1959. A new American variety which is very promising as a garden plant. Shown by Messrs. J. Waterer, Sons & Crisp Ltd., Bagshot (see p. 479)

FIG. 145—*Rhododendron wardii* 'Ellestree' **A.M.** May 5, 1959. An unusual form of this species distinguished by a deep crimson blotch. Shown by CAPT. COLLINGWOOD INGRAM, V.M.H., Benenden, Kent (see p. 480)

FIG. 146—Plants and the Weather: Plants in a growth room where temperature and light can be adjusted to provide a range of controlled environments (see p. 453)

Photo, The Grower

FIG. 147—*Gardenia thunbergia* at La Mortola, Italy (see p. 475)

FIG. 148—(*a*) The normal habit of a raspberry plant is to produce strong vegetative shoots one year (*left-hand plant*). In the second year (*right-hand plant*) these shoots flower, fruit and die (*left*), whilst new shoots grow from the base (*right*) to furnish canes for next year. (see pp. 454–5)

(*b*) (*below*) Four raspberry plants, all 32 weeks old, showing the effects of treatment under different environmental conditions in growth rooms. "Summer"—over 65° F., 12-hour-day length; "Autumn"—55° F. 8-hour-day length; "Winter"—33° F., no light

Left to right:

32 weeks "autumn"—no growth except for a short rosette of leaves

32 weeks "summer"—a shoot 8 feet long but with no flower buds

15 weeks "summer", 7 weeks "autumn", 10 weeks "winter"—a shoot with fruit buds, in the dormant state

15 weeks "summer", 7 weeks "autumn", 5 weeks "winter", 5 weeks "summer"—shoot on the left now producing fruiting laterals, with flowers just opening, and new shoot on right growing from base to provide next season's cane

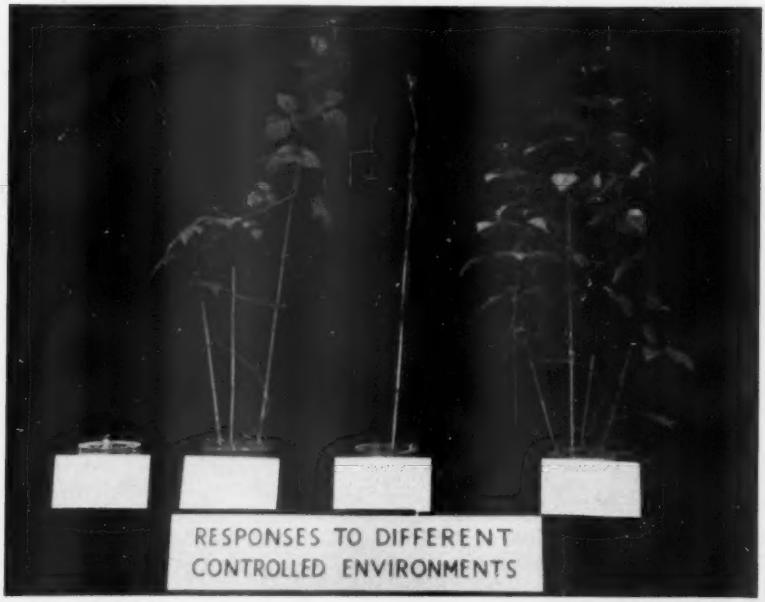


FIG. 149—Fine clumps of *Lilium auratum platyphyllum* growing in clean ground at MR. E. H. M. COX's garden at Glendoick, Perth (see p. 475)

FIG. 150—Tree ferns at Derreen, in Co. Kerry, with LADY MERSEY at foot (see p. 463)

flowers are almost dead the red crown persists to the end. 'Adamant', with its perianth of almost saffron yellow, was also most prominent in the trials—it is a variety that attracts one's attention even from a distance. Amongst the white-petalled varieties 'Brunswick' was in grand form; I place this variety very high amongst the wonderful plants raised by the late P. D. WILLIAMS, a consistently good flower of lovely form with almost a hint of green at the edge of the pale-lemon crown—it received an Award of Merit for garden use as long ago as 1947. I should personally like to see MR. RICHARDSON's 'Green Island' in these trials: I find it a wonderful plant in my own garden. 'Farewell', from MR. MICHAEL WILLIAMS, was another quite outstanding plant. One of the members of the Committee remarked on 'Stadium': it always makes its presence felt—saying that though a trifle vulgar it could not be ignored! 'Pleasing', is an appropriate name for a neat self-yellow, raised by MICHAEL WILLIAMS and given an Award last year. Amongst the yellows, 'Golden Torch' stood out as a fine upstanding variety, bold and pleasing in all ways. There are very few good red and white large-cupped varieties and without doubt the best representative in the trials was 'Kilworth', with its deep crimson-red cup and pure white perianth; this variety will probably go down in daffodil history as the best commercial and garden plant, raised by MR. LIONEL RICHARDSON. 'Flamenco', 'Penvose' and 'Silver Bugle' were all in excellent form and showed up well in the trials.

I specially noted a good double variety raised in Holland and named 'White Lion', it is a nice rounded flower with white petals and creamy-yellow segments interspersed in the centre. I noticed it was very free-flowering and carried itself well.

I sincerely hope that Fellows, the public and the trade inspect these interesting trials with some care. They form a very valuable guide to the more modern varieties that have replaced, or should replace, some of the old names that I remember so well in my youth. I marvel sometimes to see some of the quite outmoded sorts still quoted in various retail catalogues. An annual pilgrimage of the trade should be organized for them to inspect these trials, so that they may keep in touch with modern trends and at the same time enjoy some of the other delights at Wisley. One never visits Wisley without learning a lot, and Horticulture is a subject on which one never finishes learning in the all too brief span allotted to us in this world.

(see p. 463)

IRISH GARDENS AND GARDENERS

R. C. Jenkinson

PART IV

IT is a far cry to our next group of gardens in the south and west. We will therefore be borne by magic carpet to Castletownroche, near Mallow in North Co. Cork, where our cars will meet us and take us to Annesgrove. Here MR. R. GROVE ANNESLEY began to make his garden in 1905, just fifty-four years ago, against a background of great beauty.

The house stands on a plateau, facing northward. Beneath the house terrace the ground falls cliff-like to a wide meadow, through which flows the River Awbeg; upon the far side, half a mile away, rises a similar cliff, clothed and crowned by fine deciduous trees, perhaps a mile long, along which, when master of hounds, MR. ANNESLEY would draw in the certainty of finding a good fox. The natural soil is alkaline, but centuries ago a change in the course of the river left an alluvial pocket or concave slope to the west of the terrace where rhododendrons and camellias thrive. To east, south and west the garden is well protected by trees, and frost is not excessive.

Leaving by the front door and turning right on to the terrace, the first thing to catch our attention—apart from the view across the valley—is a beautiful specimen of the rare Japanese *Cornus controversa variegata* (Fig. 142). This is 33 feet tall, with horizontal branches carrying a delicate tracery of silver-white on green leaves, smaller than in the type. Nearly opposite on our right is a fine 8-foot bush of *Viburnum lobophyllum*, covered in flower this May 19, to be followed by a heavy crop of translucent crimson fruit. In front of us, as we reach the path running along the top of the cliff, is a fine piece of *Chamaecyparis nidifera* 10 feet high by 14 feet across. This hybrid between *C. nootkatensis* and *C. lawsoniana* grows, as its name suggests, in the form of a nest (nidus). Near by is a flourishing shrub of *Olearia arborescens* (*O. nitida*), with leaves silver beneath, and on our right we should notice an interesting way of growing one of the best and hardiest of the St. John's Worts, *Hypericum* 'Hidcote'. On the corner of half a dozen steps and a low supporting wall the plant falls down over the wall, carrying a sheet of large golden cup-shaped flowers from July to October.

Now we will turn our backs on the meadows and go into the walled garden, where on our left MR. ANNESLEY will show a short border of the finest *Thalictrum dipterocarpum* I have ever seen. When they flower in July, these most elegant of herbaceous plants have grown up to 9 feet high, forming a spire of little dancing lilac cups enclosing a bunch of lemon stamens, so well set off by greyish-green ferny foliage. In this garden many scarce plants grow well, but first I would show you a clump of *Hippeastrum* × *ackermanii*, happy against the south wall of a greenhouse. In June–July it has 2-foot stems of the richest blood-scarlet flowers. This, the finest of all the members of the *Amaryllis*

family that can be grown out-of-doors, likes some ashes around it during winter. Another lovely plant, from the Himalayas, which evidently enjoys the cool fairly moist conditions it finds here, is *Anemone obtusiloba patula*. A dwarfish plant of 9 inches, with scalloped silky leaves, it has sprays of mauvy-blue flowers like flat buttercups. Clumps of tigridias, of 18 inches, are gorgeous in later summer with three petals of gold, cerise or scarlet enclosing a deep mottled bowl. These bulbs are left out all winter here, yielding many self-sown seedlings. In April here I have seen a bank of *Pulsatilla vulgaris* in every shade, light mauve to dark or reddish purple, into which the plant can vary. The silky pendent flowers are followed by silky, silver tassels, which prolong its beauty for another month. It grows a foot high. At the bottom of a winding streamlet, a fine 25-foot specimen of *Stranvaesia davidiana* is notable for its white flowers, as you see now, to be followed by large flattish heads of bright red fruit. Many of the leaves of this evergreen shrub turn to orange and scarlet late in the year.

Leaving this delectable garden, we will walk along the path on top of the cliff to see what rhododendrons MR. ANNESLEY grows so surprisingly well. Of the many big-leaved species *R. coryphaeum* is attractive with its creamy flowers, purple blotched, in large trusses. It is difficult to gauge the heights of these trees on the undulating steep banks, but this must be 12 feet. *R. arizelum* is very fine, alike for its creamy-yellow, crimson-blotched flowers as for its foliage, tawny beneath; so is *R. rex*, growing up to 40 feet, with white flowers with a deep red centre, and a lovely silvery young growth turning to shiny green leaves with a light fawn indumentum. There are, of course, several trees of *R. falconeri*, and *R. macabeanum*, though smaller as yet, is very happy.

I think the form of *Rhododendron chasmanthum* that you see here is very good, a large-flowered delicate hyacinth-lilac; this bush must be 8 feet tall. *R. griersonianum* and many of his hybrids such as 'May Day', 'Tally-Ho' are well represented, and I think I saw 'Vanguard', LORD HEADFORT's lovely cross. *R. concatenans* (KINGDON WARD's "Orange Bill") is doing and flowering well, and here is MR. DE ROTHSCHILD's famous hybrid, 'Lady Chamberlain', as happy as it is at Exbury. This wonderful plant, with its rather narrow scintillating bells of some shade of orange tipped with flame, so free-flowering, is surely a rhododendron for every garden that can give it light woodland; nor is it so tender.

Now we must go down the cliff, to the river banks. On the hither bank are a few remarkable shrubs. First comes a 20-foot specimen of *Cornus kousa chinensis*, covered in flower this lovely May evening (Fig. 141). Then comes *Cercis siliquastrum*, the Judas Tree, whose still-leafless branches are wreathed in rosy-mauve pea-shaped flowers. This tree measures 15 feet by 15 feet. Remember we are close under these plants, and will see them to better advantage from the path across the river. Now here, bending over us, is a lovely crab, *Malus baccata mandshurica*, which may be a form of *M. hupehensis*, or a hybrid. Anyhow, this 25-foot tree

is very beautiful, with its snow-white mass of flowers, each like a smooth-edged Worcester tea-cup to be followed by ¾-inch bright red fruits. Further along in a cul-de-sac is a great plant of *Magnolia sinensis*, 45 feet in diameter. As we see it today, I think this is the loveliest of all bush magnolias, with its ice-white cups and purple anthers that bend to look us in the face. The tallest tree I know is in Monmouthshire. A little spring-tender, it is best planted so that early-morning sun cannot strike it.

In the bog garden itself, intersected by rivulets, grow large clumps of *Lysichitum americanum* and *L. camtschatcense*. Both have pointed, spoon-shaped, smooth leaves 2 feet long and more, within which rise in April the large spathes, just like enormous "Lords and Ladies". In the former the leaves are a cool soft green, and the spathes are pale golden yellow; the latter has blue-green leaves and pure white spathes. They luxuriate at the very brink of the bank with their toes in the water. Primulas abound, both the various candelabras in many shades, and earlier the brilliant *P. rosea*. Amongst other aquatic plants you should note the intriguing *Orontium aquaticum*; the metallic green leaves float on the surface, and when the water is disturbed the little drops run about the leaves like quicksilver. The flowers are yellow spikes borne on long white shoots a foot high. It likes shallow water up to 18 inches deep. Walking along the river bank, we cross a bridge and scale the cliff, passing three good shrubs. First a huge 15-foot bush of *Berberis francisci-Ferdinandii*, marvellous in its autumn mantle of flame and gold with red fruits. Climb on, and on the left is a fine bit of *Olearia ilicifolia*, not planted often enough. It is as hardy as *O. macrodonta*, and a neater, less rampageous shrub, here some 9 feet tall and across. It has most attractive long narrow holly-edged leaves of a curious creamy-green, and heads of musk-scented whitish flowers in June. Last, a very fine plant of one of the best of all dwarf evergreen shrubs, *Berberis calliantha* about 3 feet by 5 feet. Its shining dark green leaves are silver beneath, and it has large, cupped pale yellow flowers on comparatively long stalks. One climber we must see in the stable-yard where we collect our cars: the lovely, usually tender, *Clematis indivisa lobata*, an evergreen from New Zealand with long hanging racemes of snow-white flowers. As I saw it one April day, it was superb. Now we must leave our kind host and his beautiful garden, and remembering FLECKER, "take the Golden Road" to the far West, to Glengariff for a late dinner and the night.

Today we must make an early start. A lovely wild drive over the hills into Co. Kerry takes us in about forty minutes to Derreen on the south shore of the Kenmare river estuary. With an average rainfall of 75 inches, 6° of frost in the open and less under trees, snow a great rarity and perfect wind-shelter both from the undulating terrain and the great trees, which, with the tree ferns, were planted between 1870 and 1895 by her grandfather the MARQUIS OF LANSDOWNE, LADY MERSEY can grow almost anything. Her photograph beneath one of the taller tree ferns, *Dicksonia antarctica*, from New Zealand, indicates the

height to which they grow here (Fig. 150). Derreen is famous for its grove of dicksonias, planted and self-sown specimens. While LADY MERSEY is gradually adding to the gardens such choice plants as Rhododendrons 'May Day' and 'Vanguard', and several of the tender *Maddeniis* and *Edgworthiis*, there are some large old trees for us to admire. The first two outstanding plants are *R. grande* 25 feet tall, and *R.* 'Fragrantissimum', 15 feet by 15 feet, the latter weighed down by flower trusses, both superb specimens and both planted about 1916. A young *Aesculus indica* is already 30 feet, and *Clethra arborea*, to be a pillar of sprays of lily-of-the-valley flowers, very sweet in July, is 18 feet.

The slow-growing *Thujopsis dolabrata*, 55 feet, has a wide circumference, while several specimens of a *Chamaecyparis*, all between 60 and 70 feet, which I take to be *C. lawsoniana gracilis pendula*, are attractive. Now look at this remarkable *Cryptomeria japonica elegans*. It is leaning, with a great prop across the path, at an angle of 45 degrees; it has four vast arms, the tallest of which is 60 feet high from tip to ground measured vertically. Then we come to a good 20-foot tree of *Arbutus andrachnoides* with its charming cinnamon bark. *Rhododendron griffithianum* is 25 feet tall, flowering and smelling beautifully, while here is *R.* 'Beauty of Tremough' no less than 40 feet. Lastly, 25 feet of *Photinia serrulata* has a wide spread.

If LADY MERSEY will take us to a point where we can look across the estuary, we shall see the promontory of Rossdohan, by Parknasilla, to reach which would mean a longish drive into Kenmare and out along the northern shore. This has recently been bought by MR. RALPH and his brother MR. PHILIP WALKER. Finding much fallen timber lying about when they took it over, their situation was not improved by a great gale in the spring of 1957. But I have no doubt that their enthusiasm will clear the mess and allow us to see more easily than I did a year ago the rare treasures which they have found, and are getting named. The many trees, sowing themselves like weeds, of *Clethra arborea* are only comparable to those at Tresco. The biggest is 40 feet tall. The extraordinary thing is that *Mitraria coccinea* is using some of them as a host and running up to 20 feet high. Seen thus, its brilliant vermilion tubular flowers are dazzling. Then there are many plants of the beautiful silver tree fern; again from New Zealand, *Cyathea dealbata*. The long fronds do not droop, so we can see their lovely milk-white undersides. *Acacia melanoxylon*, with creamy puff-balls for flowers, is 70 feet; the many other choice and tender shrubs I hope we shall see for ourselves in a few years—*Dodonaea*, *Pittosporums*, *Olearias* and many more. This short preview will perhaps whet your appetites. But now we must leave Derreen and Co. Kerry and go, after a quick luncheon in Glengariff, to take boats for transport to Garinish Island, or Ilnacullin, that wonderful island in Glengariff Bay where the late MR. ROLAND BRYCE and his father before him created an Italianate garden, with the architectural help of MR. HAROLD PETO.

After MR. BRYCE'S death four or five years ago, Ilnacullin was taken

over by the Commissioners of Public Works, which assures it for posterity. It is administered for them by their Assistant Principal Architect, MR. S. F. MASKELL, himself a keen gardener and plantsman, who has the great benefit of the assistance of MR. MACKENZIE, the late owner's head gardener, whose knowledge of this rocky island and its plants is unrivalled. He could hardly have found a place in the British Isles to work in and love farther from his native Elgin.

As we leave the little pier, we walk up a straight path, high-walled on one side. There is a fine 25-foot specimen of *Torreya californica*, which, as we saw at Birr Castle, is quite hardy, but whose rich green leaves three times as long as those of a yew, make it attractive anywhere. A tree of 35 feet labelled *Pseudotsuga douglasii* (*taxifolia*) *albo-spica* is new to me—perhaps some of you know it? At any rate this mid-May day it is charming with its creamy young shoots. On the wall, facing north, a piece of *Pilostegia viburnoides* covers its allotted space and more. This evergreen self-clinging climber, with its 6-inch-long shiny leathery leaves, and panicles of creamy-white flowers in the autumn, is surely one of the most valuable evergreen scandent plants, yet one so seldom sees it. In the broad grass verge in front, that sprawling 5-foot bush is the rare *Fokienia hodginsii* from Eastern China, with flattened leaves rather like a *Thujopsis*; it is rather tender, but is happy in any protected maritime garden.

Let us go and see some of the big-leaved rhododendrons growing in a little dell against a high bank of rocks. An extremely good plant of *R. wightii* 10 feet tall is as good as we shall see it. In the *Lacteum* series, it has large trusses of pale yellow flowers with a crimson eye. *R. sinogrande* and *R. falconeri* are big old trees; a young *R. giganteum* is already 15 feet tall, while *R. sinogrande* var. *boreale*, 17 feet, is most attractive with very long dark leaves, silvery beneath, much narrower than in the type. This plant has yet to flower, but they should be soft yellow, sometimes with a crimson blotch. Going back through the walled kitchen-garden towards the house, in a shrubbery on the left are three very good shrubs. *Pittosporum dallii* is very large, 22 feet by 27 feet across. It has dark green leaves and is very resistant to wind, and hardy. Its flowers are greenish white, redeemed by their scent. *Olearia furfuracea* has always appealed to me; its leathery metallic-green leaves, with silver undersides, are valuable throughout the year—and for cutting for winter decoration. It has large white flower-heads in autumn. This plant has reached 15 feet. *Olearia myrsinoides* is not common. Here it is 12 feet by 12 feet. Its greyish leaves are musk-scented, which alone makes it worth while, but it is rather tender.

Now we will walk straight to the house, and go off in a different direction. Outside a side-door on this north-facing wall is a very good form of *Clematis spooneri rosea*, more properly called I believe, *Clematis vedrariensis*. Not so strong-growing as *C. montana rubens*, one of its parents, its flowers are 2½ inches across with broad, thick sepals, of a lovely shade of soft pink, deeper on the reverse. To your right that

superb plant that you can smell from here is *Rhododendron* 'Princess Alice', 8 feet by 8 feet. More of these tender rhododendrons anon.

Going out by another door we come along a short double-sided border. On the right are two very choice trees: *Taiwania cryptomerioides* from Formosa, 30 feet tall. We saw a more perfect specimen at Headfort, but this I suspect is the tallest in the country. Two or three years ago it looked very poorly, but MR. MACKENZIE's good cultivation has brought it back to good health. Next to it is the rare and tender *Dacridium cupressinum*, 20 feet tall. This is the 'Rimu' or red pine of New Zealand, where it grows up to 200 feet. There may be bigger trees in these islands—possibly at Tresco—but for sheer perfection of shape this is the finest I know. Its very slender pendulous branchlets hang down vertically, and are bronzy green. On our left that cut-back shrub is NOT *Cassinia fulvida* which at a distance it so closely resembles, but *Olearia solandri*. It will soon be again the 7-foot rounded shrub I saw three years ago, with twiggy shoots and little bronze-and-gold leaves, most attractive and amenable to wind. Behind it that 40-foot tree with the silver under-leaf is *Tilia olivieri*, perfectly hardy and always keeping this graceful dome-shaped habit. The biggest tree I have seen is at Westonbirt in Gloucestershire, in Silk Wood, a perfectly balanced specimen of 80 feet. This would be a fine park tree.

At the end of this short border there is a group of shrubs amongst which a 40-foot tree *Athrotaxis laxifolius* is outstanding, beautifully symmetrical with rich green adpressed foliage. Do not confuse this with its confusing sister, *A. cupressoides*, whose awls (or leaves) are tightly adpressed. Here is another Tasmanian, the rare and tender *Callitris oblonga*, and not far away the even rarer *C. cupressoides* (*C. rhomboidea*), which may also come from S.E. Australia. The former will grow up to 20 feet, the latter to 30–50 feet. Both are slender, upright and remind us of some fine-foliaged cypress. They have elegant little branchlets and very small light, bright green leaves: their delicate tracery would be a challenge to the finest of the ancient Chinese carvers. I believe more gardens of this favoured type could, and should, try them. *Thujopsis koreana*, 18 feet tall, is a delightful specimen with flattish, vivid green leaves white beneath, perfectly hardy; and further on in the long grass walk lined by conifers, the outstanding tree is *Tsuga yunnanensis*, of 34 feet, with the ends of the horizontal branches rather pendulous. In habit it is like its cousin *Tsuga dumosa*, but its leaves are a lighter green. Lower down this walk, you can smell today from 25 yards away the delicious scent of that creamy-white pyramid, which is *Myrtus letchleriana*, from Chile. The ½-inch starry flowers are borne in clusters which completely smother the bright green, red-stalked leaves—in which respect it differs from its Andean neighbour *M. luma*. It was only introduced in 1927, by H. F. COMBER, and before it is dubbed "tender" should be given a chance to show its beauty in sheltered positions in a wider variety of gardens.

Bearing to the right, the borders widen out and display six wonderful

trees or shrubs amongst many. Here on the left is the very rare *Dacrydium kirkii*, which grows to 50 feet in New Zealand, and has attained 20 feet here. In its slightly curved, pointed, yellowish green leaves, yew-like but more widely spaced, it closely resembles *Podocarpus nubigenus* from the Eastern side of the Pacific. Possibly tender and much to be cherished. Then comes a lovely 25-foot tree of the Chilean *Weinmannia trichosperma* with fern-like lustrous green leaves and creamy flowers; and *Phyllocladus glaucus*, 10 feet, with large, fan-shaped, pinnate leaves, properly called cladodes, hard and silvery. A fine 18-foot specimen of *Agathis australis*, the Kauri pine, is in perfect health—we previously saw this doing well at Mount Usher. *Acacia riceana*, usually a conservatory shrub, has grown up to 15 feet. It has a graceful, weeping habit and needle-like bronze green foliage. The flowers are pale yellow in short pendent spikes.

As the path narrows, we come out into the large rectangular Italian Garden. A low wall with narrow borders above and below encloses the lawn and pool. It is planted, among other things, with *Hakeas*, with pine-like leaves and curly cream flowers; *Grevillea rosmarinifolia* and *G. alpina* respectively taller and crimson, and dwarfer and carmine and white; and *Callistemons* such as the yellow *C. salignus* and *C. citrinus splendens*, with scarlet bottle-brushes, the latter probably the best as it is certainly the hardiest of the genus.

Alas! we must leave this rocky islet, comparable only with Tresco in the Isles of Scilly, and possibly Logan in Wigtownshire: what greater praise or incentive can one give? But as we go towards the pier the path leads through a wide bank of trees and shrubs where MR. MASKELL is wisely cutting and cleaning, showing up a magnificent tree of the evergreen *Quercus cuspidata*, 25 feet tall by 30 feet—a pleasant final memory to take with us on our way back to Ardnagashel House, six miles east of Glengariff along the Bantry Road, where we are to spend the night. After a short rest and some refreshment, if you are not too tired after an already long day, shall we take a short walk round this old place which COLONEL and MRS. RONALD KAULBACK acquired thirteen years ago, turning the house into a summer hotel, and gradually adding new plants to a derelict garden? He, having accompanied CAPTAIN KINGDON WARD in 1933–4 on his expedition to Upper Burma and Tibet as entomologist and serpentologist, is naturally anxious to make a collection of all K.W. rhododendrons, while MRS. KAULBACK proposes to plant all the tender ones marked E. and F. in the *Rhododendron Handbook*. Curiously, the rainfall is only 52 inches, 20 less than at Ilnacullin, and partly owing to this fact MR. MACKENZIE tells me that this garden is even more favoured by nature, with its almost complete wind-shelter, than Ilnacullin.

Apart from youngish rhododendrons, there are only a few things to see here—but they are very good. *Abies venusta* is 80 feet tall with a girth at 4 feet of 10½ feet. Unfortunately, a rare wind got in and has whistled the top, but it is a great specimen. The late MR. BRYCE, who

knew plants, said that this *Podocarpus salignus* (*chilina*) is the biggest in the British Isles, and I do not doubt his asseveration. It is 75 feet high with a circumference of over 50 yards, paced. We have seen this beautiful tree several times, with its linear, deep shining green leaves about 4 inches long, but a tree like this, never! *Cephalotaxus drupacea*, a shrubby species, is 12 feet, while *C. fortunei* from China is more upright and has reached 14 feet. The dark, lanceolate leaves of the latter are up to 3 inches long. Both are hardy. *Cryptomeria japonica* is a remarkable tree, about 70 feet tall with a complete petticoat of layers, themselves up to 50 feet. *Crataegus punctata*, attractive alike in flower and when carrying its large dull crimson fruits, owing to overhead interference is only 15 feet high but its spread is 33 feet. (We spent hours cleaning and pruning this plant last spring.) *Escallonia montevidensis*, here, of course, in the open, is 13 feet by 15 feet in diameter. It bears large panicles of white in late summer. *Quercus suber*, a Spanish tree which spills over into North Africa, is very fine. Its deeply-furrowed trunk provides the cork which, amongst other invaluable uses, stoppers our wine bottles the world over. This tree has a girth of 8 feet 3 inches at 4 feet and a circumference at the perimeter of its branches of 61 feet. Are there any bigger? Lastly, to show the rate of growth at Ardnagashel, *Drimys winteri latifolia*, with 7-inch leaves glaucous beneath and covered by creamy white trusses as you see it this evening, has reached 24 feet, although only planted in 1948.

We had better go in for dinner. Afterwards as we sit outside with our coffee, watching the westering sun slanting its rays across Bantry Bay and the low hills beyond, with the water lapping the bouldered shore not 30 yards from the front door, I would like to tell you of a little garden called Ahakista on the other side of the Bay, on one of the long slender fingers that stick out south-west into the Atlantic. MISS HONOR HAMILTON moved here a few years after the war, from Glengariff, bringing across a few of her good rhododendrons such as 'Tally Ho'. Her local devil is the wind, against which she puts up all possible defence. Her luck was in finding a few good established plants. It was curious to find a 48-foot tree of *Magnolia acuminata* unspoiled by wind. *Senecio rotundifolius*, of course, loves all the breezes that blow, and is 10 feet by 12 feet across. There are many plants of the not-so-tender *Euphorbia mellifera*, growing up to 3 feet. It has the usual spurge flowers, greenish and yellow, with in this case black centres, and in addition the scent of honey as its name suggests. The most interesting thing is that MISS HAMILTON tells me she extracts from the full-open flowers a pale lime-green dye which she uses for her beautiful needlework. The plant I love best here is a dwarf Scots pine. It is a perfect mushroom, about 12 feet high and across. It stands all by itself at the edge of the lawn, on top of the sea-wall and 20 feet from the tideway. No one knows if it is self-sown or imported.

And so to bed, after the last of the gardens on this tour.

RHODODENDRONS FOR FULL SUN

Frederick Street

(*Lecture given on May* 5, 1959, MR. H. G. HILLIER, V.M.H., *in the Chair*)

THERE are two possible dangers in the title of this lecture: one is that it tempts providence by assuming that there will be some full sun this year and the other is that it implies that rhododendrons which grow without shade are exceptional. This is not so, because most of the rhododendrons that are grown in this country have no protection.

There is great pleasure in argument, and one of the most enjoyable and entertaining in horticulture is the old species versus hybrid discussion. But the truth is that it is only an academic point because there is a place for all different plants. To lay down a law that only species should be planted would be like saying that it is only possible to go sailing in a "Class" racing boat or to ride horseback on a pure bred arab.

The rhododendrons generally considered to be suitable for growing in full sun are the hardy hybrids, those classed as "A" and "B" in the *Rhododendron Handbook* of The Royal Horticultural Society.

These two classifications mean: "A"—Hardy anywhere in the British Isles, and "B"—Hardy anywhere in the British Isles but requires some shade to obtain the best results.

It should be mentioned that there are two reasons for the "shade" qualification. One is that, very occasionally, the plants grow out early and they may suffer damage in the growth from spring frosts. But the chief reason is that many of them are late flowering and, when there is hot sunshine at the end of May and during the early part of June, the flowers are inclined to burn and fade more quickly.

The hardy hybrids are known by various names, some not as complimentary as they might be—"Ironclads", the "Old Waterer Hybrids", "Commercial Varieties" and the "Catawbiense hybrids".

Being interested in the effect of words, it seems to me possible that there is an unfortunate effect of euphony in that word "catawbiense". It has a sound of a guttural oath whereas, for example, *augustinii* sounds more like a fast running stream through a birch wood.

It is appropriate that we should now consider the effect of *Rhododendron catawbiense* on the cultivation of the genus because this year is the sesquicentenary (a word of recent pleasant memory) of its introduction into this country.

There is an old saying that "to know all is to forgive all" and if we understand the contribution that has been made to the general cultivation of rhododendrons in this country by *R. catawbiense*, and the other species which have been used in breeding the hardy hybrids, it will be possible to forgive the trace of mauve which comes through to many of them.

There is little doubt that this species is the most important to the

general popularity of the rhododendron. The chief reason is that it is very hardy and has been known to withstand 60 degrees of frost in its native Catawba Mountains in the south-eastern United States, where it grows on slopes and "mountain summits". Another advantage is its habit. This is close and neat, well furnished to the ground. Not one that we admire today but it was a shape that enabled the Victorians to appreciate the beauty of the rhododendron as a flowering shrub among the strictly formal patterns of their gardens. During the time that the rhododendron was first being raised and bred in this country, symmetry was the final requirement in plants and garden design.

The breeding and raising of hardy rhododendrons began with the introduction of *R. catawbiense*, although there were many other species that had been introduced before.

R. maximum, the Rose Bay of the Carolinas, was one of the plants brought to us by the famous partnership of COLLINSON and BARTRAM in 1736. It is a late-flowering species with a pink flower and a blotch. Probably, it is the source of many of the rhododendrons with a deep flare or blotch in the centre of the upper petal, many of which are returning to popularity. The foliage is also attractive in that it is often light silver or brown in its young growth. If it has a fault, it is that some of the hybrids follow this parent by having the flowers partly obscured by the young growth. It is a hardy and adaptable plant, for it is found in Nova Scotia and it grows on the Appalachian Mountains all the way down to Georgia.

In 1763 came *R. ponticum* which, in the view of some people, has become a weed. However, it is a very useful plant although now much maligned. MISS GERTRUDE JEKYLL, in her book, *Wood and Garden*, which is still, for many people, the text-book of modern gardening, gives it high praise. It can be very cool and attractive, particularly if white or cream rhododendrons are planted near to it. That it does not require woodland conditions is shown by the following quotation from *Trees and Shrubs Hardy in the British Isles*, by W. J. BEAN: "It is seen at its best in open spots fully exposed to the sun, where it can take its natural form and spread in its own way."

R. arboreum was introduced in 1796 although it did not flower until 1825. There are many forms and it is probably of equal importance to *catawbiense* because it gave the colour to the early hybrids. It also has the very great advantage of being able to pass on the colour without necessarily passing on its rather tender constitution.

R. caucasicum, a scrub plant from the Caucasus Mountains, is another that was used by the early hybridists. It has a neat habit and a long flowering period. It grows at a height of 8,000 feet, in full exposure, and is very hardy.

The importance of all these species is that, apart from *R. arboreum*, they are all capable of being grown in full exposure, they are very hardy to wind and frost, they are not affected seriously by sunlight and they are capable of withstanding drought.

These were used by the early raisers to produce a number of hybrids, some of which are still grown today. *R.* 'John Waterer' is the classic example, being a cross between *R. catawbiense* and *R. arboreum*. *R.* 'Lady Eleanor Cathcart', which is a little over a hundred years old, is a hybrid of *R. maximum* and *R. arboreum*. *R.* × *nobleanum*, in its many forms, is *R. arboreum* × *R. caucasicum*, was raised in 1835, and, to illustrate its value today, received the Award of Garden Merit in 1926.

These are some of the very few of which the parentage is known with some degree of accuracy. Considerable secrecy surrounded the raising of new plants in the early nineteenth century, a restrictive practice which, fortunately, is no longer applied: rhododendrons which are shown nowadays for awards invariably have the parentage announced.

The next step in the production of these plants was to cross the first hybrids that were raised with one another, to improve them by a process of selection and recrossing. These were always tested under hard conditions, with no shade and no protection.

More species had been introduced (for example, *R. cinnabarinum* came to this country in 1849) but the nurserymen felt that the hybrids that they had already raised could be improved. Their aim was summed up by WILLIAM WATSON in his book, *Rhododendrons and Azaleas*, in the *Gardeners' Chronicle*, "Present-Day Gardening" series:

"To raise plants that were hardy, sturdy, and shapely in growth, so that when not in flower they were good-looking shrubs, whilst the flower heads, to satisfy the requirements of the time, were to be large and full. The flowers holding themselves up, of good substance, the colours pleasing, and, most important of all, they were not to expand before June."

This brought the development up to about 1870 and the type of plant was that produced as a result of this policy is illustrated by rhododendrons 'Cynthia', 'Doncaster', 'Lady C. Mitford' and 'Mrs. Holford'.

There the development of the hardy hybrid rhododendron may have stopped but for an important turning point—the use of *R. griffithianum* (*aucklandii* as it was then known), which had also been introduced in 1849.

This species, although not hardy, had many advantages to give to the hardy hybrid rhododendron. The flower was large and of fine form, pale pink fading to nearly white, with a faint scent. It had a quality that had been lacking in the sturdy rhododendrons so far produced.

But it had certain disadvantages in the light of WILLIAM WATSON's manifesto. It was tender, it was leggy and it flowered in early May.

Probably the finest hybrid that has been produced from it is R. Loderi (in its various forms), which is the result of a cross between *R. griffithianum* and *R. fortunei*. However, it is a plant that prefers shade. It will not grow in full exposure in the often difficult positions where hardy hybrid rhododendrons not only survive but flourish.

The raisers of the day saw the value of this plant. But it had to be used, like *R. arboreum*, so that the tender constitution would not be passed on to the hybrids.

The result is that no hardy hybrid rhododendron is a direct cross with *R. griffithianum*. Instead, first crosses with the hardy species were used with the newer hybrids to produce more hardy hybrids. In this way it was possible to improve the quality of the flowers of the hybrids without sacrificing their reliability.

Two of the first crosses that were largely responsible for passing on the benefit of *R. griffithianum* were *R.* 'George Hardy'* (Fig. 138) (or 'Manglesii'), which is *R. griffithianum* × *R. catawbiense*, awarded a First-class Certificate in 1885 when exhibited by the firm of Veitch, and 'Alice Mangles'* (*R. griffithianum* × *R. ponticum*), raised by MANGLES and given a First-class Certificate in 1882.

These were used in England largely by the WATERERS, and a typical example of a hybrid that was raised from a cross between one of them ('George Hardy') and one of the old hardy hybrids is *R.* 'Pink Pearl'. This popular plant is often accused of having a coarse shade in the colour. This is much more apparent when it is grown in shade than when it is grown in full sun.

At about the same time, similar work was being carried on in the greenhouses attached to the Royal Porcelain Factory in Berlin, using *R. griffithianum* with some of the older hybrids raised on the Continent—'Leopold de Leipzig', 'Robert Croux' and others which are little known in this country. (It was interesting to see several of these varieties still in cultivation and on show at the International Floralies in Paris.)

These original crosses were bought by the firm of C. B. Van Nes and Co. of Boskoop in Holland in 1896. The most important of them was probably *R.* 'Queen Wilhelmina', which was used by VAN NES in much the same way as the WATERERS had used 'George Hardy'. *R.* 'Queen Wilhelmina' was crossed with other hardy hybrids and the plants that were the result were those that are now well known—'Britannia', 'C. B. Van Nes', 'Earl of Athlone' and 'Mrs. A. M. Williams', which recently received a First-class Certificate after trial at Wisley. These were all introduced after the 1914–18 war as some of the other names—'Armistice Day', 'Unknown Warrior'—demonstrate. As in the British nurseries, these were all tested in the open with no shade or shelter of any kind.

The hardy hybrids were brought to their present perfection largely through the work of the late MR. GOMER WATERER, who followed the practice of his forefathers by breeding and selecting, using the hybrids that were already proved to be hardy, free flowering, and resistant to sun, wind and rain.

* The synonym 'Manglesii' for 'George Hardy' is given in an article in the *Gardeners' Chronicle*, Vol. 39, p. 242, "Hybrids of *R. griffithianum*", by J. C. Bagshot. There may be some confusion between all three because the foliage of *R.* 'George Hardy' shows much more resemblance to *R. ponticum* than to *R. catawbiense*.

A few other species have been used in raising hardy hybrid rhododendrons and many have produced plants that will stand full sun and other difficult conditions. *R. thomsonii* was used by Standish and Noble at Sunningdale Nurseries. When it was first received, they grafted scions on to an old standard in order to obtain flowers more quickly. 'Ascot Brilliant' is their best hybrid from this species, and 'J. G. Millais' is another *R. thomsonii* hybrid which will grow well in the open.

R. fortunei was used by Messrs. Pauls very early after its introduction but without any great success. But probably having a better form, Messrs. Slococks have produced many excellent hybrids with *R. fortunei*, one of the most distinctive being 'Queen Souriya'. *R. campylocarpum* was introduced two years after *R. griffithianum* but it was not until 1926 that the first really hardy hybrid with yellow flowers was introduced by Slococks, namely *R.* 'Goldsworth Yellow'. This has *caucasicum* blood in it (through the other parent, *R.* 'Jacksonii'), which no doubt contributes hardiness.

This is the background to the breeding of hardy hybrid rhododendrons and the interesting point about their cultivation, which results from it, is that they are better in full exposure than they are under woodland conditions. If they are grown in a place that is too kind and too soft, they become rank and coarse. The flowers take on a similar colour. Not only will they grow in the open, but they prefer to be treated a little rough. When it is necessary that they have to stand conditions of strong sunlight without any protection and probably with lack of moisture those with crinkled petals ('John Walter' and 'Purple Splendour' are two good examples) seem to be better able to withstand heat and glare.

We are almost reaching the stage when it is finally realized by everybody that azaleas are rhododendrons and, consequently, they should not be left out of a selection that will stand full sun.

A particular reason for mentioning them is that last year the only sun that we seemed to have came towards the end of May and the beginning of June. At that time, the stool-ground at the Knaphill Nursery, which is right out in the open, was a wonderful sight of colour which was undamaged, not only by sun, but by strong wind and occasional heavy showers.

It is fairly obvious that azaleas would stand full sun because the name is derived from a Greek word meaning dry. It is a strange fallacy that azaleas need shade and moisture when some of the best can be seen growing in conditions that are completely the opposite.

The Knaphill strain of azaleas are probably the best today and I describe these because of my experience of last year, seeing them grow in the open, and flower fully and freely.

They have been raised from all the species that have anything of value to offer.

R. viscosum (the "Swamp Honeysuckle"), said to have been brought to this country as long ago as 1680 by BISHOP COMPTON, is one that still

shows its influence. This provides scent and colouring to the foliage. Its disadvantage is that the growth sometimes comes out too early and obscures the flower. "Swamp Honeysuckle" implies a moisture requirement, but this rhododendron will stand up to sun and drought as well as any. *R. viscosum* was followed by *R. nudiflorum* and *R. roseum*, introductions by the COLLINSON/BARTRAM partnership in the early eighteenth century. These give more scent, a little more colour to the flower and better presentation without the screen of foliage.

R. luteum (*Azalea pontica*) is probably one of our best garden plants and has a well deserved Award of Garden Merit. It was introduced by the German botanist PALLAS (who was employed by the EMPRESS KATHERINE of Russia) and it came to this country in 1793. Its yellow flowers with their bitter-sweet perfume, and its autumn colour, are almost well known enough not to need description. Like *R. caucasicum*, it grows in full exposure on the Caucasus Mountains.

In 1806 *R. calendulaceum*, described by BEAN as being the source of the colour in the best of the garden varieties, was introduced to France by ANDRÉ MICHAUX although it had been discovered by WILLIAM BARTRAM (son of JOHN BARTRAM) in 1776. The fact that this plant does not like shade may be seen from his original description of first seeing the flowers: "The clusters of the blossoms cover the shrubs in such incredible profusion on the hillsides, that suddenly opening to view from dark shades, we are alarmed with the apprehension of the hill being set on fire."

Those words "opening to view from dark shade" indicate that in its original home it was not confined to woodland conditions.

All these species were used by P. MORTIER, a baker of Ghent, to produce the "Ghent" hybrid azaleas.

In 1823, *R molle* was first introduced to England but it was little used. And in 1830 *R. japonicum* came to Belgium in the middle of the Revolution, although it was originally intended to be taken by VON SIEBOLD to his garden at Leiden in Holland. It was later introduced to this country by FORTUNE in 1850. *R. japonicum*, which has been used both for its colour and for its constitution, grows in the open on mountain sides in Japan.

Much work was done in Belgium and Holland in hybridizing these plants and in 1850 *R. occidentale* came to this country. This species has probably had as much influence on the azalea as any other. Again, in its natural home, it grows in the open. True, it is limited to the banks of streams but the country is verging on desert.

Much of the early work was done by the WATERERS and by DAVIS of Ormskirk and, even before that, by DEAN HERBERT.

It is hardly surprising that the Knaphill strain of azaleas, which incorporates all the good qualities of the species mentioned above, should stand full sun for there are none that demand woodland conditions in their natural homes. It is very probable that the old idea sticks that they like woodland because, when they were first introduced, there was

little or no knowledge of the importance of acid soil for these plants and it was probably found that they would grow in woods where there would be a plentiful supply of leaf-mould. Occasionally, they would no doubt have been found to grow in gardens with acid soil but where this was not available then the wood was the only place where they would have settled down. The idea that all rhododendrons and azaleas must have shade is a dangerous fallacy that may limit their use. The number of varieties that may be grown in the open is greater than those that need shelter.

NOTES FROM FELLOWS

Cherries in Tokyo

WHEN I was last in Japan, in the spring of 1927, one of the principal sights of Tokyo was the wonderful display of cherry blossom to be seen in and around that city. I was told that in the Ueno Park alone there were then no fewer than 2,400 trees of flowering age, mostly belonging to the variety known as Yoshino (*Prunus yedoensis*), while the estimated number for the whole city and its suburbs amounted, at that time, to as many as 92,000.

MR. K. WADA of Yokohama, who has recently been on a visit to Europe, informs me that since I was in Japan these lovely trees have been devastated by Fireblight and that the relatively few survivors are all sadly disfigured by that fell disease.

Sic transit gloria mundi.

COLLINGWOOD INGRAM

Gardenia thunbergia at La Mortola

This interesting and beautiful shrub has had a somewhat chequered history in my garden.

About sixty years ago, my father-in-law, SIR THOMAS HANBURY, planted two small shrubs of this *Gardenia*. As it came from South Africa, he chose a dry sunny slope facing south. The plants grew and flowered freely, but never looked happy.

They should have been beautiful all the year round, as in addition to shiny dark green leaves and dazzling white, very strong scented flowers, they bear decorative seed-pods, which hang on for several years, ovoid in shape, creamy white in colour, and as hard as old ivory.

But alas! here, as long as I've known them they always looked miserable.

Each new shoot or twig would die off at the tip, the leaves turning a sickly yellow and falling, more and more dead white wood appearing. Shortly after the second world war, finding them still just alive I decided

to tackle them; the tallest was then about 12 feet high, a well-shaped tree but obviously dying; so hopeless did they look, that summoning up my courage, I had them moved, choosing a sunny but sheltered spot, with good soil.

It took four men to shift the tallest; we got it up with a good ball of earth, secured it with planks and wired it round; the second bush we moved also. The first year they seemed happier, we'd cut out all the old dead wood, and the new leaves came dark and shiny, but by the second year, the shoots again began to die off at the tips, and the leaves to fall.

I gave them two years, then as there was no improvement I resolved on stronger measures, having by now the boldness of despair. I took the plants on a barrow some distance down the garden, and planted them some way apart, in good soil, one in deep shade, one in semi-shade.

The tallest I cut down to 2 feet from the ground, and hoped for the best.

By the next year it had sent up several shoots, 2 to 3 feet high, with healthy dark green leaves.

Now, eight years later it is once again over 10 feet high! The second plant also did well (Fig. 147).

They both flower freely, but up till now, neither shrub has produced seed-pods! Perhaps someone could tell me why? Possibly it does not seed until it has reached a certain age? In this case, one must have patience and count a change of position as a re-birth!

Gone now are my two miserable white ghosts, their dead stems looking like bones! This proves once more my theory that both trees and shrubs, even when big, like—actually like—and thrive, on a change! In fact, like people, they rejoice at being taken notice of!

I must, however, confess that I gave both trees an injection against shock consisting of sulphate of bones and mixed in cow manure deeply buried in the earth beneath.

MRS. DOROTHY HANBURY-FORBES, O.B.E.

La Mortola Gardens,
Ventimiglia, Italy.

Clean Ground and Lilium auratum

We are absolutely certain that the older and longer cultivated the garden, the more essential it is to plant all lilies in clean ground, which has not known a lily bulb for years. On several occasions we have planted lilies in the same ground after a lapse of two or three years only to find them disappear in a year or two with virus. As between the wars we used to plant batches of the notoriously infected *L. auratum platyphyllum* from Japan, it is not surprising that much of our soil is suspect.

Four years ago MR. DE GRAAFF sent us six bulbs of virus-free *L. auratum platyphyllum* and we decided to give them a fair chance of

survival. We made a new bed in age-old turf right in the open in full exposure and at the edge of a frost-pocket. The bulbs have never been shifted. This year the left-hand group of three carried 166 individual flowers on ten stems, the right-hand group 177 individual flowers on eleven stems (Fig. 149).

E. H. M. COX

Glendoick, Perth.

WISLEY TRIALS, 1959

DIMORPHOTHECAS

Twenty-one stocks of dimorphothecas were received for trial at Wisley in 1959. The trial was sown in the open ground in shallow drills spaced 15 inches apart on April 20, 1959. The resulting seedlings were thinned and singled to leave each plant standing 1 foot apart in the row.

The trial was inspected by a sub-committee of the Floral Committee A on July 3 and 10, 1959, and on its recommendation the Council has made the following awards to dimorphothecas.

The number in brackets after the description of the variety is that under which it was grown in the trial.

AURANTIACA HYBRIDS MIXED IMPROVED. (Raised and sent by Messrs. L. Clause, S. A., Bretigny-sur-Orge, France.) **A.M.** July 10, 1959. Plant very vigorous, erect and very compact, 15 to 18 inches high, very free-flowering; flower stems 7 to 12 inches long; flowers 2¼ to 2½ inches diameter, single, mixed colours including white, pale yellow, golden yellow, salmon, orange, zoned at the disc with a narrow purple band; disc ⅝ inch diameter, orange. [19]

BUFF BEAUTY. (Sent by Messrs. Ernst Benary Ltd., Hann-Munden, Germany.) **A.M.** July 3, 1959. Plant vigorous, compact, 10 to 12 inches high, very free-flowering; flower stems 4 to 9 inches long; flowers 2½ to 3 inches diameter, single, a clear delicate shade of Marigold Orange (H.C.C. between 11/3 and 11/2), zoned at the disc with narrow band of purplish black; disc ¼ inch diameter, yellow surrounded by a narrow band of bluish purple. [5]

GOLIATH. (Raised and introduced by Messrs. Vilmorin-Andrieux, S. A., 4 Quai de la Mégisserie, Paris, France; sent by Messrs. Vilmorin-Andrieux, S.A., and Messrs. Samuel Dobie & Son Ltd., 11 Grosvenor Street, Chester.) **A.M.** July 10, 1959. Plant vigorous, erect and fairly compact, 15 to 18 inches high, very free-flowering; flower stems 10 to 14 inches long; flowers 3¼ to 3½ inches diameter, single, a clear bright shade of Marigold Orange (H.C.C. between 11 and 11/1), zoned at the disc with narrow band of purplish black; disc ⅜ inch diameter, orange. [12] and [14]

ORANGE GLORY. (Raised, introduced and sent by Messrs. Watkins & Simpson Ltd., 26/29 Drury Lane, London, W.C.2.) **A.M.** July 3, 1959. Plant vigorous, spreading, 10 to 15 inches high, free-flowering; flower stems 9 to 12 inches long; flowers 3¼ inches diameter, single, a clear bright shade of Marigold Orange (H.C.C. between 11 and 11/1), zoned at the disc with narrow band of purplish black; disc ½ inch diameter, yellow. [6]

D. AURANTIACA. (Sent by Messrs. Watkins & Simpson Ltd.) **H.C.** July 10, 1959. Plant vigorous, erect and compact, 15 to 18 inches high, free-flowering; flower stems 8 to 10 inches long; flowers 2½ to 3 inches diameter, single, a clear bright orange near Marigold Orange (H.C.C. 11/1), zoned at the disc with narrow band of purplish black; disc ½ inch diameter, golden yellow. [8]

AURANTIACA MIXED SELECTED. (Sent by Messrs. Nutting & Sons Ltd., Merstham, Surrey.) **H.C.** July 10, 1959. Plant vigorous, erect and compact, 14 to 18 inches high, very free-flowering; flower stems 9 to 12 inches long; flowers 2¼ to 2½ inches diameter, single, mixed colours including white, pale yellow, golden yellow, salmon, orange, zoned at the disc with narrow band of purplish blue; disc ½ inch diameter, orange. [21]

GOLIATH. (Raised and introduced by Messrs. Vilmorin-Andrieux, S.A., and sent by Messrs. Samen-Mauser G.A, Rathausbrucke, Zurich, Switzerland.) **H.C.** July 10, 1959. Plant vigorous, spreading, 12 to 18 inches high, free flowering; flower stems 10 to 14 inches long; flowers 3 to 3½ inches diameter, single, a clear bright shade of Marigold Orange (H.C.C. between 11 and 11/1), zoned at the disc with band of deep purplish blue; disc ½ inch diameter, orange. [13]

PLUVIALIS RINGENS. (Sent by Messrs. Watkins & Simpson Ltd.) **H.C.** July 10, 1959. Plant vigorous, spreading, 9 to 12 inches high, very free-flowering; flower stems 5 to 7 inches long; flowers 2¼ to 2¾ inches diameter, single, white, zoned at the disc with broad band of purplish blue; disc ⅝ inch diameter, yellow. [2]

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1959

Abelia triflora A.M. June 9, 1959. This graceful, Himalayan shrub, growing to a height of 12 feet or more in this country, has opposite ovate-lanceolate, long acuminate leaves about 2½ inches long and 1 inch wide, and bears terminal clusters, about 2 inches across, of very fragrant, white flowers, flushed pink in the bud. The individual flowers are 1½ inches across, salver shaped, with 5 spreading rounded lobes and a cylindric tube about ¾ inch long, surrounded by the five linear ciliate, slightly shorter sepals. Exhibited by L. M. Mason, Esq., Talbot Manor, Fincham, King's Lynn, Norfolk.

Aesculus × mutabilis induta A.M. June 9, 1959. A hybrid chestnut, the parentage given by REHDER as *A. discolor mollis* × *A. neglecta*, forming a large shrub or small tree with palmate leaves consisting of five, short-stalked, elliptic, serrulate leaflets about 5 inches long, dark green and glabrous above, densely villous and glaucescent beneath. The 6-inch terminal panicles of tubular 1-inch flowers between Dawn Pink (H.C.C. 523) and Camellia Rose (622/1) in colour, are tinged with yellow and borne in May and June. Exhibited by Sir Henry Price, Bt., Wakehurst Place, Ardingly, Sussex.

Begonia 'Rosanna' A.M. May 25, 1959. A very handsome variety with large double Cherry (H.C.C. 722/3) flowers of good form. The colour deepens towards the edges of the petals. Raised and shown by Messrs. Blackmore & Langdon, Bath.

Deutzia 'Joconde'. A.M. June 9, 1959. A useful hybrid *Deutzia* of garden origin, covered with rather stiff panicles of white flowers, the outside of the petals having a broad streak, along the centre, of Mallow Purple (H.C.C. 030/3), making the unfolded buds appear purple. When fully open the flowers are about 1¼ inches across and expose the central boss of yellow anthers and winged filaments. Exhibited by L. M. Mason, Esq., Talbot Manor, Fincham, King's Lynn, Norfolk.

Metrosideros robusta A.M. May 25, 1959. An evergreen Australasian shrub, belonging to the Myrtle family, best grown in a cool greenhouse, though hardy in the Scilly Isles and parts of S.W. England. The opposite, elliptic leaves are slightly notched at the apex, about 1½ inches long and ½ inch wide with a noticeable marginal vein. The flowers, in terminal clusters up to 3 inches across, are rendered conspicuous by the numerous Blood Red (H.C.C. 820/1) stamens, each about ½ inch long. Exhibited by Messrs. G. Reuthe Ltd., Fox Hill Nursery, Keston, Kent.

Rosa 'Fritz Nobis' A.M. June 9, 1959. An excellent, free-flowering shrub rose of arching habit, raised from a cross between *R.* 'Joanna Hill' and *R. rubiginosa magnifica*, bearing numerous double pink, scented flowers near to Carmine Rose (H.C.C. 621/3 and 621/2) in colour and about 4½ inches across when fully open. Exhibited by The Sunningdale Nurseries, Windlesham, Surrey (Fig. 143).

Rose 'Meteor' A.M. May 25, 1959. A floribunda variety with Signal Red (H.C.C. 719/1) flowers of good size very freely produced. Raised by Herr Reimer Kordes and shown by Messrs. Samuel McGredy & Son, Portadown.

Rose 'My Choice' A.M. May 25, 1959. A very attractive H.T. rose resulting from a cross between 'Wellworth' and 'Ena Harkness'. It is notable for its perfume, growth and freedom of flowering. The large Rose Opal (H.C.C. 022/1) flowers are of good form. Raised and shown by Mr. E. B. Le Grice, Roseland Nurseries, North Walsham.

Rose 'Orangeade' A.M. May 25, 1959. This very free-flowering floribunda variety resulted from a cross made by Mr. Sam McGredy IV between 'Orange Sweetheart' and 'Independence'. The flowers are large, single, Capsicum Red (H.C.C. 715) with darker shading towards the margins of the petals. Shown by Messrs. Samuel McGredy & Son, Portadown.

Rose 'Jane Lazenby' A.M. May 25, 1959. A floribunda variety resulting from a cross between 'Alain' and 'Mme. Henri Guillot'. The large bright deep Carmine Rose flowers are borne with great freedom. Raised by Mr. Sam McGredy IV and shown by Messrs. Samuel McGredy & Son, Royal Nurseries, Portadown, N. Ireland.

Rose 'Lili Marlene' A.M. May 25, 1959. A floribunda variety

raised in Germany by Herr Reimer Kordes. The large near Currant Red (H.C.C. 821) flowers are very freely produced. Shown by Messrs. Samuel McGredy & Son, Portadown.

CAMELLIAS AND RHODODENDRONS

Camellia japonica 'R. L. Wheeler', A.M. March 24, 1959. Although this cultivar was first listed as late as 1951 in the American check list *The Camellia: Its Culture and Nomenclature*, it is quickly proving of outstanding value as a garden plant and one for the show bench. The flowers are Anemone Form, measure some 5 inches across and the sixteen petals are in two rows and coloured Carmine (H.C.C. 621–621/1). On the petaloids is some limited, white flecking; the stamens are few and inconspicuous, the majority being petaloid. Serrations on the leaves are rounded. Exhibited by Messrs. J. Waterer Sons & Crisp Ltd., The Nurseries, Bagshot, Surrey (Fig. 144).

Camellia japonica 'Rubescens Major', A.M. March 24, 1959. Flowers on this cultivar are Formal Double, 4 inches across and the petals coloured a pale shade of Carmine (H.C.C. 621). Around the edges of the leaves the serrations are small. Exhibited by Messrs. J. Waterer Sons & Crisp Ltd., The Nurseries, Bagshot, Surrey.

Rhododendron (elliottii × 'Fusilier') 'Beefeater', F.C.C. May 25, 1959. A description of this plant was given in the R.H.S. JOURNAL, **83,** 488. It was exhibited from the R.H.S. Gardens, Wisley, Ripley, Woking, Surrey.

Rhododendron chaetomallum F.25601, A.M. April 7, 1959. In many respects this species is a variable one and particularly so in the amount of leaf indumentum and colour of the flowers. On MR. DE ROTHSCHILD's plant the truss was five-flowered, loose and drooping and the corolla, with its deep basal nectaries, was coloured Turkey Red (H.C.C. 721). On the underside of the leaves there was a dense indumentum, light brown in colour. Exhibited by E. de Rothschild, Esq., Exbury, nr. Southampton.

Rhododendron (Shepherd's Delight g.) 'Fleece', A.M. April 21, 1959. From the crossing of R. Loderi and R. 'Luscombei' the singular shade of pink from the latter parent has predominated to give the hybrid a most attractive flower. Each one is coloured a varying degree of Rhodomine Pink (H.C.C. 527/2) with some deep pink flushes and limited red spotting on the upper lobe. Seven such flowers make up each loose truss. Exhibited by Mrs. R. M. Stevenson, Tower Court, Ascot, Berks.

Rhododendron (elliottii × wattii) 'Morvah', F.C.C. May 5, 1959. A description of this plant appeared in R.H.S. JOURNAL **81,** 464. Exhibited by Lt.-Col. Sir Edward Bolitho, K.B.E., D.S.O., Trengwainton, Heamoor, S.O., Penzance.

Rhododendron (eriogynum × 'Tally Ho') 'Rosenkavalier', A.M. June 9, 1959. On this plant the large, heavy truss is composed of fifteen

blooms. Each flower is 4 inches across and coloured Scarlet (H.C.C. 19/1) with scattered, red spotting on the upper lobes. The nectaries are deep and stigma pubescent towards its base. On the underside of the leaves there is a fawn indumentum which, upon touch, quickly becomes glabrous. Exhibited from the R.H.S. Gardens, Wisley, Ripley, Woking, Surrey.

Rhododendron ('Exbury Naomi' × litiense) 'Tosca', A.M. May 5, 1959. This is a hybrid of recent introduction with a rounded, neat truss made up of ten flowers. On each the corolla is 3¾ inches wide, shallow campanulate and coloured Primrose Yellow (H.C.C. 601/3) while the opening buds are tinged with pale pink. Exhibited from the R.H.S. Gardens, Wisley, Ripley, Woking, Surrey.

Rhododendron wardii 'Ellestree', A.M. May 5, 1959. This particular form of *R. wardii* is easily distinguished by a deep crimson blotch in its throat contrasting sharply with the remainder of the clear yellow corolla. It is unusual to see a blotched variant of this sort although MR. DAVIDIAN has reported a fine specimen at the Royal Botanic Garden, Edinburgh. Exhibited by Capt. Collingwood Ingram, F.L.S., V.M.H., The Grange, Benenden, Cranbrook, Kent (Fig. 145).

BOOK NOTE

"Die Cactaceae." Vol. II. By Curt Backeberg. 721 pp. Illus. (Gustav Fischer, Jena, 1959.) DM. 87.

The first volume of this monograph by Curt Backeberg was reviewed in the R.H.S. JOURNAL in July 1958; the second volume has now appeared. This deals with the first part of the sub-family *Cereoideae*, that is, the Tribe *Hylocereeae* and the beginning of *Cereeae*, as far as the genus *Pseudolobivia*, thus including 69 genera. Of the five genera listed without numbers in the table in Vol. I, the name *Diploperianthium* has been changed to *Calymmanthium*, whilst *Floresia* appears in a different position, being now placed between *Weberbauerocereus* and *Echinopsis*. Even if the classification is still subject to alteration in minor ways, the amount of information here collected together is a very valuable contribution to the study of this family. There are 768 illustrations, most of them in monochrome and most of them excellent; the colour plates are variable in quality but are a useful addition. There has been a demand for an index to each volume but, after due consideration, the publishers have decided that this would not only increase the price but would also delay publication, so it is proposed ultimately to publish a sixth volume which will include a complete index. This work is essential to all serious workers on the *Cactaceae* but rather detailed for the amateur with a small collection.

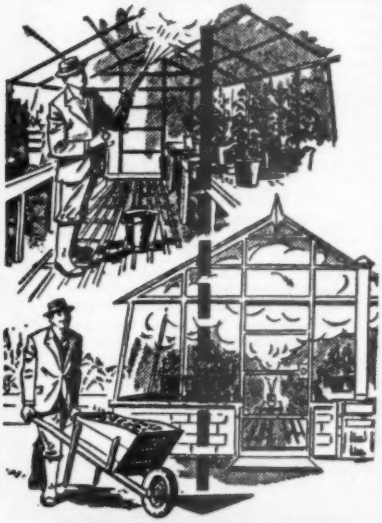
VERA HIGGINS

ORDERS FOR BOOKS

The Society does not sell any publications other than its own. Orders for books reviewed should therefore be sent direct to the booksellers and not to the offices of the Society.

The contents of this volume are copyright. For permission to reproduce any of the articles application should be made to the Council.

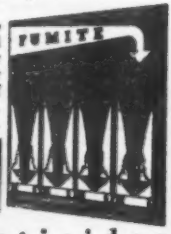
There *is* an easier way,
Mr. Sutherland



Let **FUMITE** **do the work!**

With these *Smoke Pesticides* insect and fungoid pests in your greenhouse are quickly and easily controlled. In fact, treatment before planting out can *prevent* damage altogether! FUMITE is the pesticide used and recommended by professional growers everywhere.

This handy FUMITE 'Help Yourself' Unit is in your local shop now. Ask your retailer to recommend the particular smoke you need. A tube of four pellets costs between 1/6d. and 2/6d., according to type.



FUMITE

smoke pesticides

FUMITE DDT/LINDANE — FUMITE LINDANE
FUMITE TCNB — FUMITE AZOBENZENE

From seedsmen, chemists and through all branches of Boots. In case of difficulty, write to:

WAECO LTD. (Fumite Division), High Post, Salisbury, Wilts. Tel: Middle Woodford 282/3/4

THE fortnightly show

a good excuse for lunch with a glass of wine at the Stores

DAFFODILS

for the house or garden —personally selected in Holland by our own Buyer. May we send you our full bulb list?

Large flowers sturdy stems
MAGNIFICENCE *golden yellow very early*
EASTER JOY *rich yellow one of the earliest*
9/6 dozen 70/– 100

GIANT FLOWERED VARIETIES
full trumpet
FLOWER CARPET *yellow 18"*
KING ALFRED *yellow 16"*
MOUNT HOOD *white 14"*
QUEEN OF BICOLORS *white & yellow 14"*
MUSIC HALL *white & yellow 16"*
First size 8/6 dozen, 65/– 100
Second size 7/6 dozen, 55/– 100

half trumpet
ARANJUEZ *yellow & orange*
CARLTON *yellow frilled cup*
FORTUNE *yellow & orange red*
CAVALERIO *white & light orange*
CARBINEER *yellow & orange*
First size 8/6 dozen, 65/– 100
Second size 7/6 dozen, 55/– 100

EVERYTHING FOR EVERYONE

A&N

ARMY & NAVY STORES
Westminster SW1 Victoria 1234 day & night
5 minutes' walk from R.H.S. Hall

BLACKMOOR ESTATE
LIMITED

offer

FRUIT TREES & BUSHES

renowned for quality and reliability

★

Only the very finest *rootstock* is used. Trees are now obtainable on the newest *Malling-Merton* rootstocks. In addition the tried and tested E.M. VII and IX are available.

Beeches and Limes of the highest quality are available, well suited for *Hedging*.

Please write for *Free Catalogue*, informative and lucid, a real help. Pollination tables included.

BLACKMOOR ESTATE LTD

Fruit Nursery Dept. J.R.H.

LISS (Tel.: Blackmoor, Hants 276/7) HANTS

Neal's

KETTERING

LOAM

Supplied to Leading Horticulturists for over 30 YEARS

Finest Yellow Fibrous Kettering Loam as **exhibited** at the Chelsea Show. Also John **Innes Composts**, Bedfordshire Silver Sand **and** Nottingham Marl. Quotations for any **quantity, delivered** by Rail or Road Trans**port to your door, or loaded** on your own **lorries if you collect.**

Special terms for Horticultural Societies.

KETTERING FUEL CO. LTD. (DEPT. RHS)
STATION ROAD KETTERING NORTHANTS

DRON-WAL *Supreme* SPRAYERS & SYRINGES

Highly suitable for all Horticultural and Greenhouse Spraying

ILLUSTRATED LISTS OF SYRINGES, SPRAYERS ETC., SENT UPON REQUEST

OBTAINABLE FROM

SEEDSMEN, IRONMONGERS AND STORES

The PHILIP B. WALDRON CO.

Kings Road, Tyseley, BIRMINGHAM, 11

YOUR PLANTS NEED SEDGE PEAT PRODUCTS

ECLIPSE

★ **RHODODENDRONS**—Special product available for all acid-loving plants

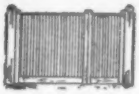
★ **HUMULL**—for **FEEDING LAWNS and FINE GRASSES.** Now is the time to feed a drought-impoverished lawn

Write for BOOKLET

THE ECLIPSE PEAT COMPANY LTD.
ASHCOTT, Box No. 12, BRIDGWATER
Somerset

FENCING AND GATES

OAK GATES



OAK FENCES

Also

"Riviera" Split Bamboo Screening in 10 yd. rolls, 4 ft., 5 ft. or 5 ft. 9 ins. high. Hazel and Osier hurdles and Teak Furniture, Wovenwood.

GERALD GILMER LTD.

TEL. 1640/1 **LEWES** EST. 1922

And at BISHOP'S WALTHAM. Tel.: 271

MICHAELMAS DAISIES

Bring Colour and Brightness to your garden

Here, at Buckland Nurseries, I grow over 170 of the finest and newest varieties in the country. You will find the loveliest and most exciting colours amongst these glorious new varieties — pale pink to rich crimson and light blue to rich purple — and some of the flowers are 3" across. Now is the time to choose, buy and plant, and next year an autumn garden of great beauty will be yours.

SPECIAL COLLECTION. One each 12 superb varieties. Rufus, Chequers, Orlando, Rosy Wings, Fellowship, Autumn Rose, Blandie, Marie Ballard, Peerless, Moderator, Patricia Ballard, Mistress Quickly. 30/- (actual value 38/-). Carriage Paid, C.W.O.

NEW CATALOGUE **FREE**

Listing Michaelmas Daisies, Border and Rock Plants. (*Stamp appreciated.*)

BUCKLAND NURSERIES

REIGATE, SURREY. *Phone: Reigate 2990*

CHEAPEST! EASIEST! FRUIT STORAGE EVER!

1. NO FLOOR SPACE NEEDED.
2. EVERY FRUIT VISIBLE.
3. INDIVIDUALLY ISOLATED.
4. COMPLETE PROTECTION FROM AIR-BORNE SPORES.
5. LESS MOISTURE LOSS — SO FRUIT STAYS FRESH.
6. INSULATION AGAINST TEMPERATURE EXTREMES.
7. STORERS LAST FOR YEARS.

Store your fruit as easily as hanging up your hat! No floor space required, you just loop the tubes on a nail and the job's done! Scientific protection system delays over-ripening so fruit keeps fresh, stores longer. No shrivelled skins. You'll never use another cumbersome rack, tray, box or loft gadget once you've tried "POLY-STORERS". Complete kits for 28 lbs. of fruit only 6/9d. 56 lbs. 13/-, 1 cwt. 25/-. Post Free. Order now!

PROV. PAT. 15947/59

POLY-STORERS

(Dept. 6) 208 HOOK ROAD, CHESSINGTON, SURREY

GREENHOUSE HEATING EQUIPMENT...

Phillips Boilers are confidently recommended for their exceptional value and economy in operation. Boilers or complete sets can be supplied. Thousands of satisfied users. Boilers are available in 5 sizes from £9 19. 0. Send for complete list.

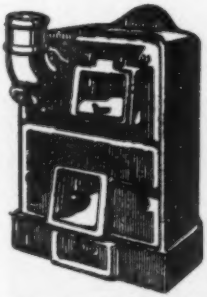
COMPLETE APPARATUS

Examples:—

Prices include boilers, smoke stack, etc. all h.w. pipes, stays, expansion joints, bolts, etc., ready to fix. Easy to follow instructions sent with every apparatus. Prices are for a house with two 4" h.w. pipes on one side of the house.

6 ft. × 6 ft. £18 3.0
8 ft. × 6 ft. £19 3.9
10 ft. × 8 ft. £20 17.6

Deferred terms available.



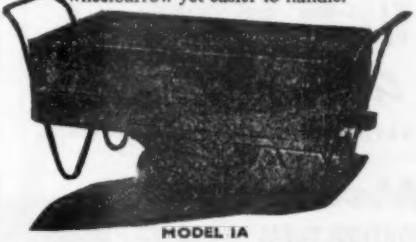
We would recommend that you send for our catalogue which gives complete details

H. E. PHILLIPS LTD

96 King William Street, Coventry

BOWLEY'S GARDEN TRUCKS

A strongly constructed well-balanced truck, specially designed for garden and nursery work, having several times the carrying capacity of a wheelbarrow yet easier to handle.



MODEL 1A

PLATFORM SIZE 4 ft. by 2 ft. with 12" DETACHABLE TOP

WHEELS 12" by 2" ROLLER BEARING CUSHIONED TYRED

CARRIAGE **£14.6.3** PAID

HINGED SIDE 12/6 EXTRA

S. Bowley & Son Ltd.

BATTERSEA BRIDGE, LONDON, S.W.11

Send for illustrated catalogue (HSJ) for complete range of sizes and models

JUSTIN BROOKE LTD.

WICKHAMBROOK, Nr. NEWMARKET, SUFFOLK

We invite you to visit our nurseries and fruiting orchards at any time, including Sundays—preferably by appointment.

We have a large acreage of nursery stock, including Roses, Peaches, Nectarines, Apricots, Cherries, Apples, Pears, Plums and Figs.

In our fruiting orchards you can see the results obtained by planting similar stocks of all these fruits; and you can see the results at various stages of growth.

We sell 12 lb. packs of apples and pears. Ask for price list.

Telephones:

In office hours—Wickhambrook **200** Out of office hours—Wickhambrook **304**

LILIES *for your garden*

Please ask for our new catalogue and colour folder describing over 200 types of species and hybrid Liliums, including most of the new Canadian and American hybrids. We also have Erythroniums and Trilliums in variety.

We specialize in growing and shipping fine Lily bulbs anywhere in the world. Bulbs are shipped to you direct, as we handle all importation details. Payment is in sterling.

Please send for our catalogue. (Airmail is fastest!)

Sandy Best · GREENOCK FARMS

GEORGETOWN · ONTARIO · CANADA

THE BEST HARDY GARDEN PINK "PRIORY PINK"

Our Novelty for 1960

This variety has the ideal cushion habit and is very free. Double flowers which have very strong stems. Colour: Blush Mauve.

3 PLANTS 7/6

6 PLANTS 12/6 12 PLANTS 22/6

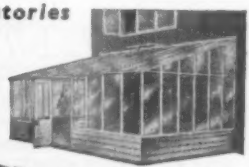
Allwood Bros LTD. *Carnation Specialists*

HAYWARDS HEATH, SUSSEX (*Wivelsfield 232*)

Conservatories

Garden

Dens...



Garages, greenhouses, loose-boxes and garden buildings of all descriptions.

Hire purchase terms available.

Please send for illustrated catalogue.

ALPHA WOODCRAFT LTD.,

Dept. 24, Star Road, Hillingdon Heath, Uxbridge, Middx. **Tel. HAYes 0657**

Messenger

HORTICULTURAL BUILDERS & HEATING ENGINEERS

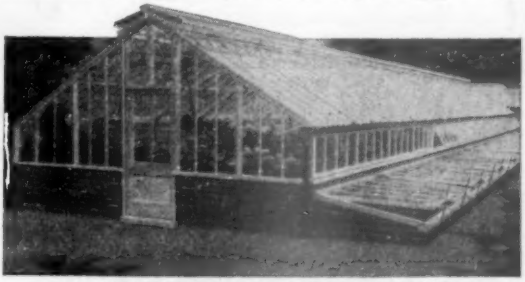
Designs and Estimates submitted at your request or we will build to your specification.

Write for Catalogue

MESSENGER & CO. LTD.

Cumberland Road,

LOUGHBOROUGH. Tel.: 2691



London Office: 46 Victoria Street, S.W.1. Tel. Abbey 2040

. . . LEAVES . . . LEAVES . . . LEAVES . . .

The Autumn Fall brings its round of toil, not only to the Council Authorities but to those with large and small gardens.

COOKS 322 Specially Designed Leaf Brooms make light work of this tedious job. These brooms are also recommended for Lawn Sweeping, the flexible fibre gives Aeration, a tonic every Lawn needs after a dry summer. Each Broom fitted with Handle and Spring Steel Stay ready for use. **This Tool lasts at least 3 years.**

Brush Head	Brushing Surface	Price Complete Carriage Paid (U.K.)
9″	15″	9/6 (For Small Gardens)
13″	21″	12/3 (For General Use)
19″	27″	17/6 (Large Gardens and Tennis Courts)
25″	33″	23/6 (Estates and Council)

A SINGLE BROOM SENT CARRIAGE PAID (U.K.)

Our Horticultural list of Brushes and Tools sent free on request.

COOKS (*Norwich*) BRUSHES LIMITED

Makers of Quality Brushes since 1814

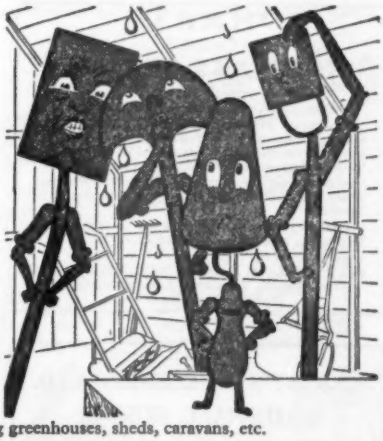
DAVEY PLACE (18), NORWICH, NORFOLK, NOR 38E

If water is your enemy

KEEP IT OUT WITH

SYLGLAS

GLAZING AND SEALING TAPE



Weatherproofing . . . waterproofing . . . indoors or outdoors—Sylglas is the answer. Sealing, lagging, caulking—for use on windows, roofs, drainpipes, gutters, maintaining greenhouses, sheds, caravans, etc.

Sylglas for any sealing purpose—the 100% waterproof product of 30 years' experience.

30 ft. rolls 1″ wide—**2/9d.**

1½″ wide—**4/1½d.**

Other widths up to 4″ wide in ½″ steps, pro rata.

Get Sylglas from Seedsmen, Hardware & Builders' Merchants, and Departmental Stores.

If you have any waterproofing problems we shall be glad to help and give you advice

THE SYLGLAS COMPANY

81 Knight's Hill, West Norwood, London, S.E. 27

Tel: GIPsy Hill 4247 (5 lines) **Telegrams: Snowwhite, London, S.E.27**

VEGETABLES FOR EPICURES

Many new and unusual varieties of vegetable seeds are offered in the 1959 edition of our Seed Catalogue. We have always specialized in supplying seeds of vegetables for epicures and if flavour and quality count more with you than mere size then you will have much to interest you in our very comprehensive list. We also offer a wide range of flower seeds, including a number of interesting novelties for 1959. Send for a free copy today.

GEORGE BUNYARD & CO. LIMITED
(Dept. 22)
THE ROYAL NURSERIES, MAIDSTONE

Orchids

GREENHOUSE & INDOOR PLANTS

Illustrated catalogue with coloured plates and cultural indications, price 6/- reimbursed at the first order of an amount of £4. The coloured plate from this catalogue illustrating 52 varieties of Caladium together with cultural indications is available at the price of 2/-

MARCEL LECOUFLE
1, rue de l' Eglise
BOISSY-St-LEGER (S & O)
France
Phone 79

PREVENT PEACH LEAF CURL

by spraying with Bunyard's

MEDELA

Leaf Curl or Blister of peaches and nectarines can be prevented by spraying Medela in February or March just before the buds open. Also effective in preventing mildew on fruit and rose trees. One pint makes two gallons of spray.
4/6 pint, 8/6 quart, 13/6 ½-gallon, 20/- gallon.
Carriage paid. Cash with order.

Get your supply direct from the makers
GEORGE BUNYARD & CO. LTD.
(Dept. 21), MAIDSTONE

DISTINCTIVE CONIFERS

Cupressus sempervirens stricta. The Italian Cypress quickly makes a dark green column 10 ft. high, 1 ft. wide, growing slowly after that, and is the most elegant of all fastigiate conifers. 10/6 each, £5 per dozen.

Ginkgo biloba laciniata. A rare and decorative form of the Maidenhair Tree. 10/6 and 15/-.

Pinus pinea. The Italian Umbrella Pine. Small plants, 5/-.

Araucaria araucana. 10/6 and 12/6.

Packing and carriage extra; catalogue on request

SANDHURST NURSERIES
Sandhurst - Camberley - Surrey

'HART'

Certified

GRASS SEED

Treated against birds and pests
Cash with order, carriage paid, bags free
"Standard" Mixture of Sheep's Hard and Red Fescue, Browntop, R.S. Meadow Grass, S.23, N.Z. Devon Eaver and S.S. Ryegrass. 1-14 lb. 3/- per lb.; 15 lb. and upwards 2/9 per lb. (cwt. rate).
Free on request: (a) Grass Seed Mixture Analysis Chart; (b) Bulletin of Fertilisers and Horticultural Sundries.
Pre-seeding Base Fertilizer (2 oz. to the sq. yd.) 1/- per lb., minimum 14 lb. and upwards.
Supplied by:—
MAXWELL M. HART (LONDON) LTD
Trial Grounds, Winnersh, Wokingham, Berks.
Phone: Wokingham 1121

AZALEA VIDA BROWN

An unusually dwarf and compact evergreen Azalea, making a dense shapely bush no more than 18 inches high and wide. Completely evergreen and entirely hardy. The double (hose-in-hose) flowers, 2 inches and more across, are deep rose pink and completely cover the bush in June.

Highly Commended after trial at Wisley

Sturdy young bushy plants 11/6 each; 3 for 32/6; 6 for 60/-. Packed and delivered free for cash with order.

Stewarts
Nurseries
FERNDOWN Est. 1742 DORSET

KNIGHT'S NURSERIES LTD.

HAILSHAM, SUSSEX
Telephone 454

For strong Sussex grown
ROSES
Please send for Catalogue

ROSES, FRUIT TREES AND FLOWERING SHRUBS

Grown by specialists—packed by craftsmen. New catalogue of our hardy Norfolk-grown stock sent promptly on request.

A. REEVES & CO.
OLD CATTON, NORWICH

SAVE MONEY

by raising your own bedding plants next spring and preserving your tender plants during the cold winter months for an even better show in the garden next year

A well constructed GREENHOUSE should have a place in every Garden. Our wide range of "All-Cedar" Greenhouses, which do not require painting, are neat in appearance and blend in with any garden layout, as well as fulfilling every requirement of the Greenhouse enthusiast

Write for Free Illustrated Catalogue of All-Cedar Greenhouses and Summer Houses

C. H. WHITEHOUSE LTD

Phone: FRANT 247 **Buckhurst Works, FRANT, Sussex**

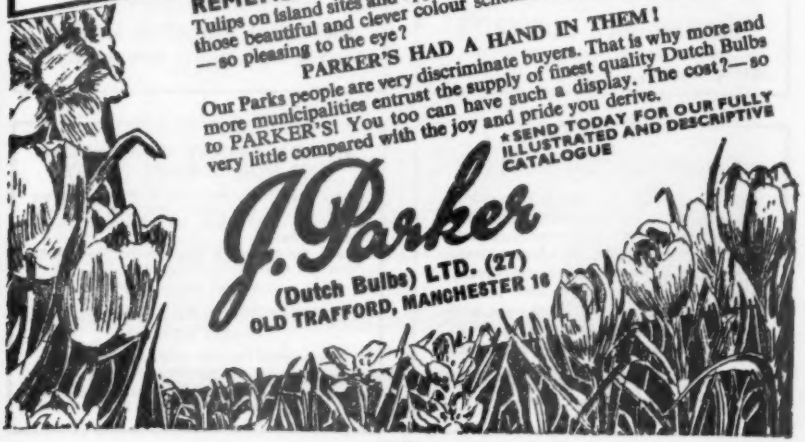
Parker's – the greatest name in Dutch bulbs

REMEMBER . . . Those gorgeous displays of Daffodils and Tulips on island sites and approaches to our cities and in our parks — those beautiful and clever colour schemes blended so harmoniously — so pleasing to the eye?

PARKER'S HAD A HAND IN THEM!

Our Parks people are very discriminate buyers. That is why more and more municipalities entrust the supply of finest quality Dutch Bulbs to PARKER'S! You too can have such a display. The cost?—so very little compared with the joy and pride you derive.

***SEND TODAY FOR OUR FULLY ILLUSTRATED AND DESCRIPTIVE CATALOGUE**



J. Parker
(Dutch Bulbs) LTD. (27)
OLD TRAFFORD, MANCHESTER 16

Godfreys
for garden machinery

The Mechanized Garden Centre
110 Marylebone Lane, W1 (Wel. 6842)
and Brenchley, Kent

FROM 1867 TO 1959
Charltons' OF TUNBRIDGE WELLS
FOR RHODODENDRONS
and Azaleas described in over 150 varieties in our Tree and Shrub Catalogue, which also offers a most extensive collection of Conifers, Climbing Plants
AND FLOWERING SHRUBS
Write today for Tree and Shrub Catalogue.
ARTHUR CHARLTON & SONS LTD.
Summervale Nurseries, Eridge Rd., Tunbridge Wells

HARDY FERNS
for shaded borders, waterside and wild garden. Especially suitable for difficult town gardens.
Our free catalogue "Hardy Ferns" describes many choice and unusual varieties. A separate list "Hardy Perennial Plants," has a section devoted to shade-loving flowering plants.
Special offer of 9 different Ferns for £1, post free, c.w.o.
TAYLOR'S NURSERY,
Bracknell, Berks,

FLORISTRY
A rewarding career or a profitable hobby. Our specialised home study Course in Floristry and Flower Arrangement covers every detail, and all equipment is provided.
Please write for our Prospectus — sent free and post free
THE RIVIERA SCHOOL OF FLORISTRY (H)
PENRYN, CORNWALL

RHODODENDRONS
SHRUB ROSES
HYDRANGEAS, AZALEAS
FLOWERING SHRUBS
GROUND COVER
PLEASE ASK FOR LISTS
SUNNINGDALE NURSERIES
The most beautiful nursery in the country
WINDLESHAM, SURREY *Tel.: Ascot 96*

HART HALL NURSERIES LIMITED
(A. D. HINSHELWOOD)
12 Rockery and Alpine Plants . 23/-
12 Heathers for year round bloom . 27/-
6 Heathers for winter flowering . 13/6
Carriage 2/6
Hardy Alpines, Primulas, Meconopses, Heathers, Dwarf Conifers
Catalogue free on request
HART HALL NURSERIES LIMITED
HYDE LANE, HEMEL HEMPSTEAD, HERTS

Belgrave Hotel, Torquay
welcomes you for the late summer months. Situated in the centre of the sea front, with our own sub-tropical gardens and sun lounge, filled with house plants and tropical flowers now. Seventy really first-class rooms, some with private bath and toilet, on two floors only, with elevator. Perfect food, with quiet willing service. Telephone 4818, or may we send you a brochure
G. H. Gillin, F.R.H.S.

HARDY FOREST TREES FROM THE NORTH-EAST COAST
Forest Tree Transplants and Seedlings; Hedging Plants; Roses; Ornamental Standard Trees and Flowering Shrubs, etc. Specialists in Canker-Resistant Poplars.
Agents for McConnel Mobile Safety Saws, Avon Portable Power Saws and Jalo Hoes.
Please write for Catalogue
GOWANS, MITCHINSON & LAMBERT, LTD.
(Forest Services)
Nurserymen, Forestry Contractors and Land Agents
41, Bondgate Hill, ALNWICK, Northumberland
Telephone: ALNWICK 2321

MURPHY AIDS to BETTER GARDENING

MURPHY LIQUID MALATHION

This highly efficient insecticide will control many insect pests and is particularly effective against Aphids (Green and Black Fly), Mealy Bug, Scale insects, White Fly adults, Red Spider, Thrips, Leaf Miner, etc.

4-oz. bottle 5/6
8-oz. bottle 10/-
1 pint tin 21/6

ORTHOCIDE

garden fungicide containing

CAPTAN

Controls many important fungus diseases on a wide range of crops. It is especially effective against Black Spot on roses and Scab on apples and pears. It will also control Storage Rots and Bulb and Corm Rots.

Size 1, 3/-
(makes 5 gallons spray)
Size 2, 9/6
Size 4, 27/6

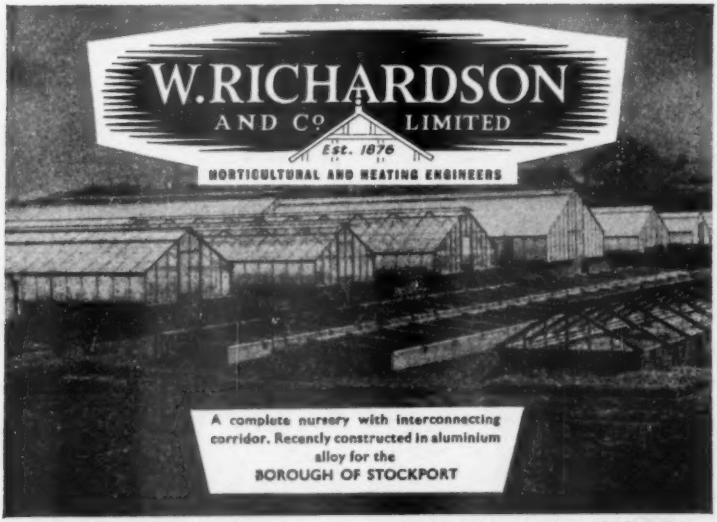
KARATHANE MILDEW FUNGICIDE

Gives a very efficient control of Powdery Mildews on a wide range of garden and greenhouse plants, particularly on roses, apples, grapes, strawberries, gooseberries, cucumbers and marrows.

Size 1, 3/-
(makes up to 10 gallons spray)
Size 2, 9/6
(makes up to 40 gallons spray)
Size 4, 27/6
(makes up to 160 gallons spray

Available from Seedsmen, Ironmongers and Chemists

THE MURPHY CHEMICAL CO. LTD., WHEATHAMPSTEAD, HERTFORDSHIRE


W. RICHARDSON
AND Co LIMITED
Est. 1876
HORTICULTURAL AND HEATING ENGINEERS
A complete nursery with interconnecting corridor. Recently constructed in aluminium alloy for the
BOROUGH OF STOCKPORT

Neasham Road, DARLINGTON — 117 Victoria Street, LONDON, S.W.1

CALIFORNIAN LILACS,

the best blue-flowered shrubs for training to sunny walls or for sheltered nooks in the open, offered in these outstanding evergreen varieties:—

A. T. JOHNSON
AUSTROMONTANUS
AUTUMNAL BLUE
BURKWOODII
CASCADE
DIGNITY
RUSSELLIANUS
} CEANOTHUS

Full catalogue sent on receipt of 1/6

Burkwood & Skipwith Ltd.
Park Road Nurseries, Kingston-on-Thames
Telephone: KIN 0296

GERANIUMS

From the Caledonian Nurseries,
Maidstone Road, Rainham,
Kent

Telephone: Rainham 81520

★

Our geraniums are grown all over the world

★

Send for our latest catalogue

save your fish from Herons . . .

. . . with our underwater 6" mesh nylon preventative NETTING. An entirely new, tested method of preserving your fish in ornamental ponds. Made to required size. Price: 4/6 per sq. yd., carr. paid. (Dyed green or other colour, 6d. per sq. yd. extra)

★ *Write for descriptive leaflet to:*
MIDACRES LTD., 24, HYVER HILL, LONDON, N.W.7

Allwood's Cut Carnations

direct from the largest growers, are the ideal gift for all occasions.
Selected colours or unique mixed shades.
From
1 gn. to 5 gns.
per box
Write for Catalogue

Allwood Bros Ltd. — *Cut Flower Dept.*
HAYWARDS HEATH, SUSSEX (*Wivelsfield 232*)

ECONOMICAL · STRONG · EASILY FIXED YOURSELF

WATTLE FENCING

Craftsmen-made
Close-woven. Also ideal for heightening walls, enclosing livestock, training plants, etc. ORDER NOW or send for FREE CATALOGUE of FENCING (all types), Gates, Arches, etc. VISIT OUR SHOWROOMS.

In 6-ft. lengths	
Height	Stakes
3ft.	14/3	1/-
4ft.	18/4	1/3
5ft.	24/5	1/6
6ft.	29/11	1/9

Special sizes to order. Reduc. doz. lots. Deep. 10/14 days. Carr. Free 100 mls. – orders under £5, add 1/– in £.

DAVIDS RURAL INDUSTRIES LTD.
(Dept. R) 15 Moreton St., London, S.W.1
(Tate Gallery 8332)

VALE for VALUE

GARDEN SHEDS
WANEY EDGE from £8 14s. 6d.
SOFTWOOD F/E from £9 19s. 6d.
CEDAR from £11 16s.

GARAGES
WANEY EDGE from £23 15s.
CEDAR from £29 15s.
SHIPLAP from £31 5s.
ASBESTOS from £29 14s.

GREENHOUSES
from £20 10s.
SUNLOUNGES from £24 8s.
Carr. paid England & Wales

SEND FOR FREE LISTS—FREE PLANS
Now easier terms from 5% Deposit
All types of Fencing, Ladders, Gates, etc.
VALE COUNTRY PRODUCTS
(Dept. R), Barkham Road, Wokingham, Berks.

THE SOUTHERN TREE SURGERY COMPANY

Arborists and Tree Surgeons

Byways,
Woodham Lock,
West Byfleet,
Surrey
(Byfleet 2739)

79 Tower Street,
Winchester,
Hants
(Tel. 3972)

Advise on, estimate for, and carry out all tree work

Supreme for FLOWERS, VEGETABLES FRUIT, LAWNS and ALL INDOOR PLANTS

SANGRAL

TEN-DAY FERTILIZER

Packets 1/– Cartons 3/–, 5/6
Bottles 2/3, 3/9 Half Gall. 15/–
CHOICE OF THE EXPERT

COME INTO THE GREENHOUSE MAUD

sings BOB GREEN, our gardening expert

What about getting your wives to have a go at the annual washdown this year, lads? Tell 'em that if it isn't done they'll get precious little from the greenhouse next year—pests and diseases will see to that! You don't fancy your chances? Well, *somebody's* got to do it, so you'd better get out your Jeyes' and do it yourself after all. Better safe than sorry!

GREENHOUSE Fumigate the greenhouse, as soon as tomatoes are finished, with a Jeyes' Sulphur Candle (first removing any plants you want to save). Then scrub or forcibly spray all glass and woodwork with a solution of two tablespoons of Jeyes' Fluid per gallon of water, taking care that it gets into every crevice and corner and between the glass overlaps. Clean your frames too in the same way.

CHRYSANTHS To ensure more and cleaner cuttings, from these stage, cut chrysanths down after flowering to about 3", clean off dead leaves and shake off soil. Next, wash in clear water until every trace of soil is removed. Now immerse for five minutes in a solution of one tablespoon of Jeyes' Fluid per two gallons of water. Allow to drain, then pack close together in boxes, covering roots with a mixture of equal parts sand and peat (*not* Jeypeat Compound).

DAHLIAS To protect winter-stored tubers from disease and insect pests during winter storage, place the tubers in a box containing a mixture of one handful of Jeypeat Compound per two-gallon bucket of ashes, sand or peat.

NEW LAWNS To discourage birds when sowing lawn seed, add a handful of Jeypeat Compound to each pound. Shake thoroughly, let the mixture stand for an hour before sowing. Rake seed well in and add a top dressing of soil or sand if necessary, to ensure complete coverage. Before laying turf for new Lawns, or when repairing old ones, work a little Jeypeat Compound into the soil to control leather-jackets.

JEYPEAT

COMPOUND

—the amazing 3 in 1 soil treatment

Jeypeat consists of finest sedge peat accurately and correctly impregnated with Jeyes' Fluid. In this form the Jeyes' Fluid content stays active much longer than when used in solution—a big advantage for many purposes.

- Jeypeat Compound cleanses soil of fungus diseases and wilt-carrying pests
- Jeypeat Compound protects growing plants from root pests. Grubs are killed on contact
- Jeypeat Compound enriches soil with the humus essential to fertility and promotes healthier growth

JEYES' FLUID

is a really powerful sterilizing preparation that's *safe to use*. Has many valuable uses includes sterilizing potting soils, deep-sterilizing badly diseased outdoor patches—destroying foliage pests, winter spraying, and the annual washdown of greenhouses and frames.

The above are only a few of the many strikingly successful applications of Jeypeat Compound and Jeyes' Fluid for FLOWERS, VEGETABLES, FRUIT, LAWNS, GREENHOUSES, etc.

A BOOK IN A HUNDRED!

It's Fred Loads' latest book, "All Grows Well",—a wonderfully helpful guide to successful gardening. Clear, practical, up-to-date, full of good and original ideas. 104 pages — only 4/6d. post free.

FREE!

Directions for main uses on containers. For fuller information write now (block letters please) for free leaflet "Jeyes' in the Garden"—packed with new and better ways of getting the best out of your garden right through the year.

JEYPEAT

COMPOUND

THE REVOLUTIONARY PARTNER TO

JEYES' FLUID

The best disinfectant on earth

JEYPEAT COMPOUND	JEYES' FLUID
Trial Garden 1/9 Popular Size 4/9	Cans—Pint 2/9 Quart 5/-
Medium Size 9/- Large Size 32/-	Gal. 10/- Trial Bottles 1/9

from the dealer who supplies your gardening requirements

JEYES' (DEPT. 186), RIVER ROAD, BARKING, ESSEX

BY APPOINTMENT
TO HER MAJESTY THE QUEEN
GARDEN CONTRACTORS AND NURSERYMEN

Waterers

TWYFORD
BERKS.

BAGSHOT
SURREY

Any (or all) of the following Catalogues will gladly be sent on request

No. 1. TREES & SHRUBS
including—Rhododendrons, Azaleas, Camellias, Japanese Cherries, Hedging & Screening Plants, Climbers, etc. (all grown at Bagshot, Surrey)

No. 2. HERBACEOUS & ROCKERY PLANTS
including—Irises, Pæonies, Michaelmas Daisies, Lupins, Delphiniums, Phlox, Hemerocallis, in numerous varieties (grown at Twyford)

No. 3. ROSES & FRUIT TREES
in all the best, both new and old varieties (grown at Twyford)

John Waterer, Sons & Crisp, Ltd.
The Floral Mile
TWYFORD, BERKS.

Printed by Spottiswoode, Ballantyne & Co. Ltd., London and Colchester